Item # 41

SEMINOLE COUNTY GOVERNMENT
AGENDA MEMORANDUM

SUBJECT: Traffic Calming Program

DEPARTMENT: Public Works **DIVISION:** Traffic Engineering

AUTHORIZED BY: W. Gary Johnson, P.E., Director **CONTACT:** Melonie C. Barrington, P.E. **EXT.** 5676
County Traffic Engineer

Agenda Date 08/09/05 **Regular** ☐ **Consent** ☐ **Work Session** ☐ **Briefing** ☒
Public Hearing – 1:30 ☐ **Public Hearing – 7:00** ☐

MOTION/RECOMMENDATION:

Brief the Board of County Commissioners on the proposed Traffic Calming Program.

Countywide (Melonie C. Barrington, P.E.)

BACKGROUND:

As a result of increasing citizen interest in reducing speeding and cut-through traffic on local, neighborhood streets, the 2001 Sales Tax initiative approved by the voters included funding for a Traffic Calming Program. The Traffic Engineering Division, with the assistance of PBS&J, has developed a Traffic Calming Handbook to provide information that will assist residents and County staff in navigating the project submittal, review and approval process for the installation of traffic calming measures.

This handbook contains information on Seminole County's Traffic Calming Program, including a description and history of traffic calming, the County's traffic calming goals, objectives and policies, the project approval process, the project eligibility and ranking process, and finally a description of devices and applications.

While definitions of traffic calming may vary, they all have in common several goals to effectively reduce or mitigate negative aspects of vehicular traffic:

1. Reduction of vehicle speeds and/or traffic volumes
2. Improving safety
3. Enhancing the quality of life

Reviewed by:
Co Atty: N/A
DFS:
Other:
DCM:
CM:
File No. BPWTE01

(Continued on Page 2)

Attachments: August 9, 2005 BCC Slide Presentation
Draft Traffic Calming Program (July 2005)

These definitions go beyond the physical devices themselves and also include the three "E's":

1. Education
2. Enforcement
3. Engineering

The overall objectives of the program are as follows:

1. Maintain or improve resident quality of life and neighborhood livability by reducing the impact of vehicular traffic on residential neighborhoods.
2. Maintain or improve the safety and attractiveness of neighborhood streets for pedestrians, bicyclists and motorists.
3. Encourage citizen involvement in the application of the Traffic Calming Program, from the initial request through implementation.
4. Address the need for balance between the public safety interests of traffic calming and emergency responsiveness.
5. Minimize the potential that any proposed traffic calming installation will shift a problem from one neighborhood to another.
6. Effectively utilize County funds and resources by validating and prioritizing citizen traffic calming requests.

Key elements to ensure success of the program will include:

1. Coordinating with emergency services providers in order to address their concerns.
2. Assessing public support for the devices prior to installing them.
3. Performing "before and after" studies to evaluate the efficiency and effectiveness of the devices.
4. Including traffic crash reduction among the measures of effectiveness being studied.

Nationally, traffic calming programs have become mainstream in improving the livability of our neighborhoods. Numerous cities and counties have implemented traffic calming programs with success. Several state departments of transportation have even adopted their own programs including Pennsylvania, Delaware, Virginia, Georgia and Vermont.

Seminole County Traffic Calming Program

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Presented to the Board of County Commissioners

August 9, 2005

Outline

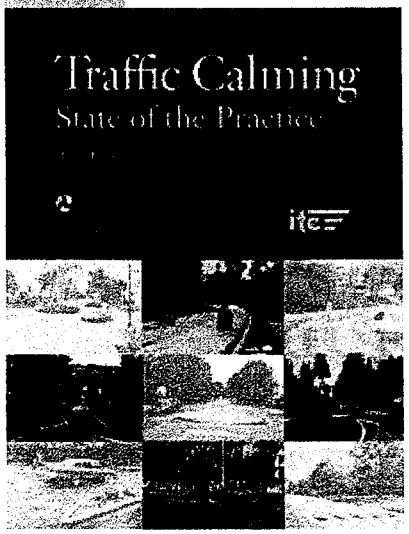
- Introduction to Traffic Calming
- Program Goals, Objectives & Policies
- Implementation Process
- Traffic Calming Measures & Guidelines
- Questions

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Introduction

- "Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users."

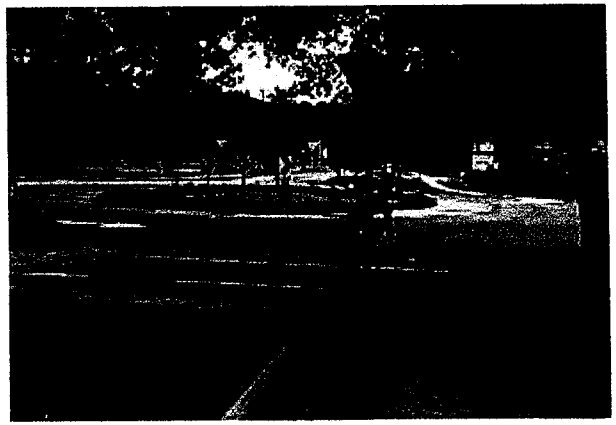
ITE Traffic Calming Handbook



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Introduction

- Goals of Traffic Calming
  - Reduce Vehicle Speeds/Volumes
  - Improve Safety
  - Enhance Quality of Life
- Also Includes
  - Education
  - Enforcement
  - Engineering



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Program Goals, Objectives & Policies

- Maintain or Improve Quality of Life and Neighborhood Livability
- Maintain or Improve Safety and Attractiveness for
  - Pedestrians,
  - Bicyclists, *and*
  - Motorists

- Encourage Citizen Involvement
- Effectively Utilize County Funds

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Implementation Process

STEP ONE

- Identification of Problem and Preliminary Assessment
  - Can be Initiated by Residents or County Staff
- Eligibility Determination
- Schedule Neighborhood Meeting
- Mail out Ballots

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FLORIDA'S NATURAL CHOICE

Implementation Process

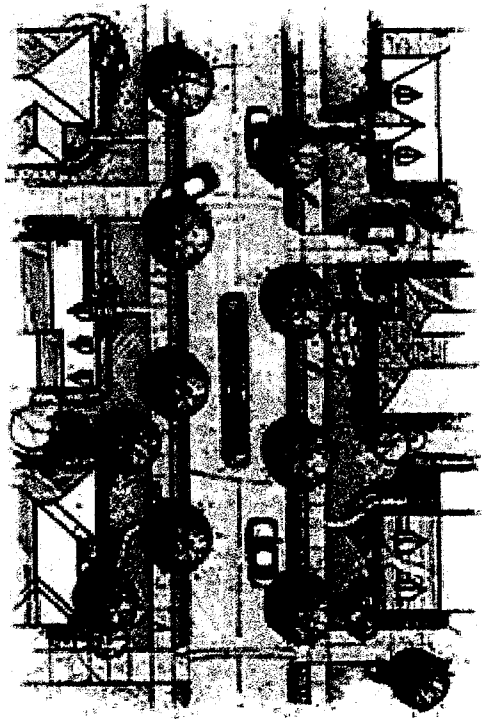
STEP TWO

- Project Analysis and Ranking
- Selection of Appropriate Device(s) and Preliminary Design
- Neighborhood Meeting
- Project Placed into Funding Queue based on Ranking Score
- Design, Construction & Evaluation

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

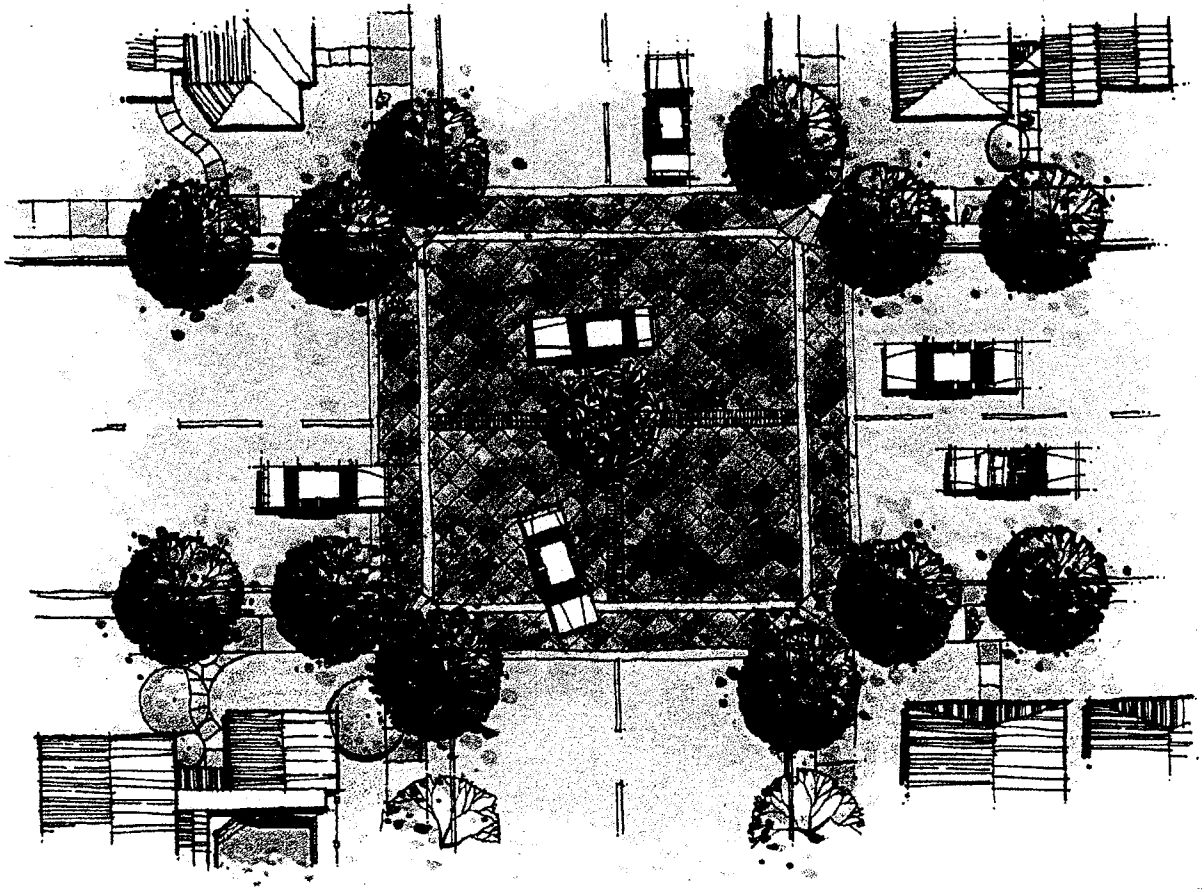
Traffic Calming Measures & Guidelines

- Recommended Device List
  - Speed Display Trailer
  - Mid-Block Choker
  - Chicane
  - Traffic Circle
  - Roundabout
  - Median/Center Island
  - Gateway/Entry Feature



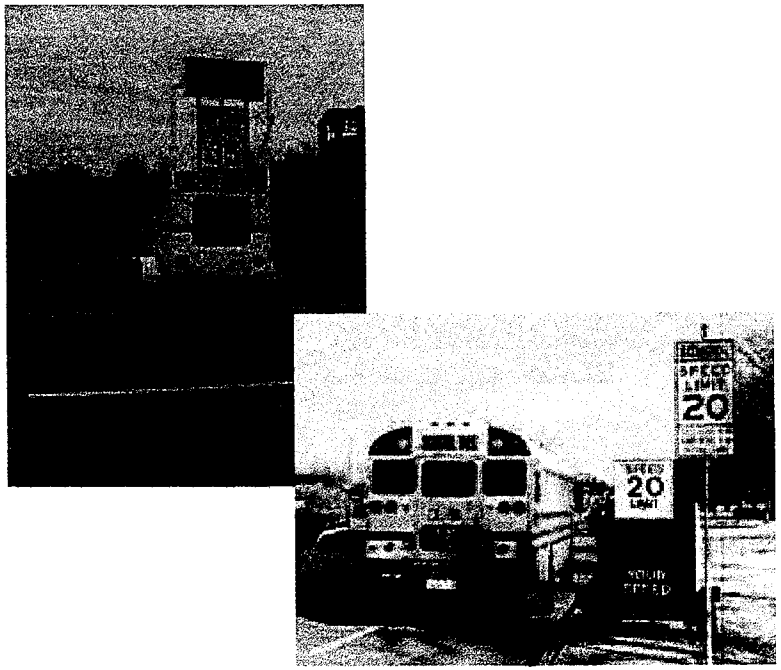
SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Questions?



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

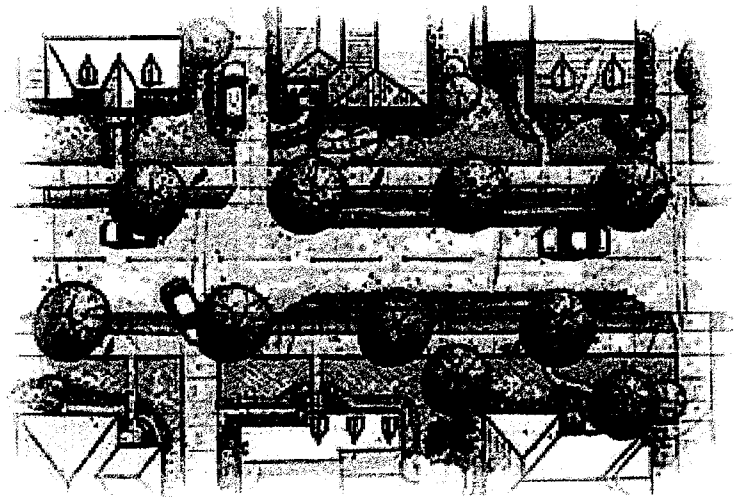
Speed Display Trailer

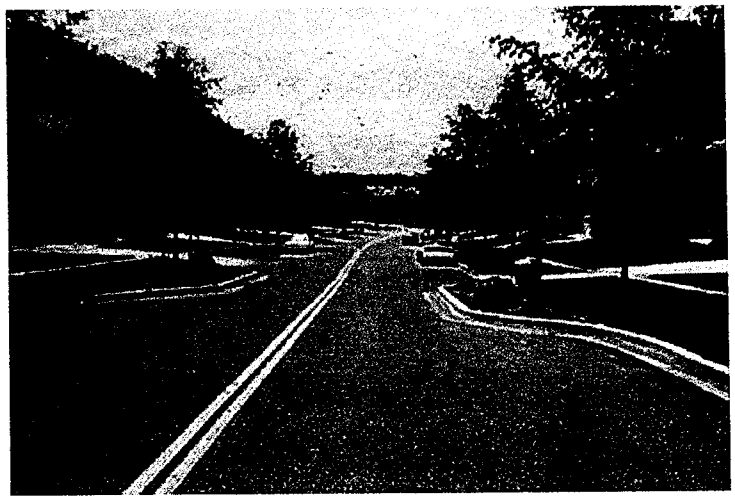


Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Reduces speed	No impacts	No impacts	No noise impacts	Minimal Pedestrian improvements

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Mid-Block Choker





Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Reduces speed	Minor reductions	Minor impacts	No expected noise impacts	Improves pedestrian safety

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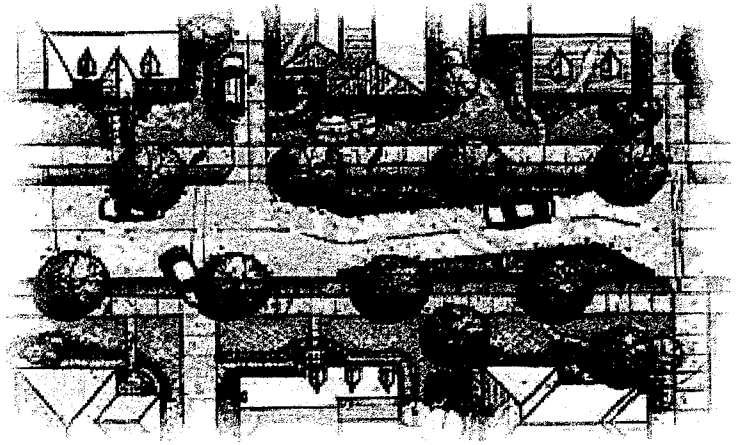
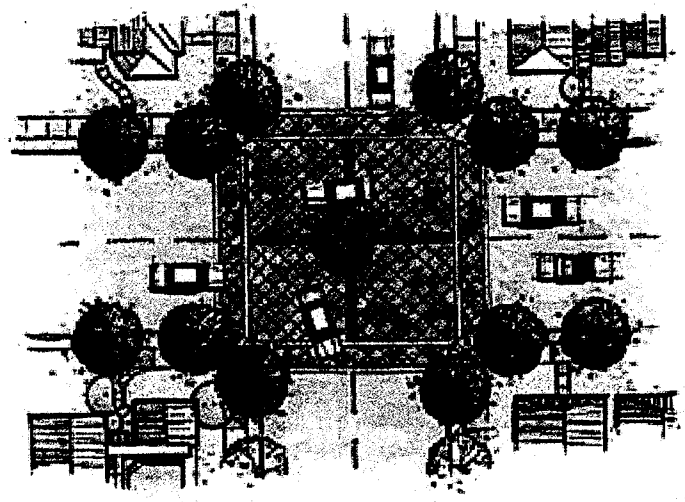
Chicane

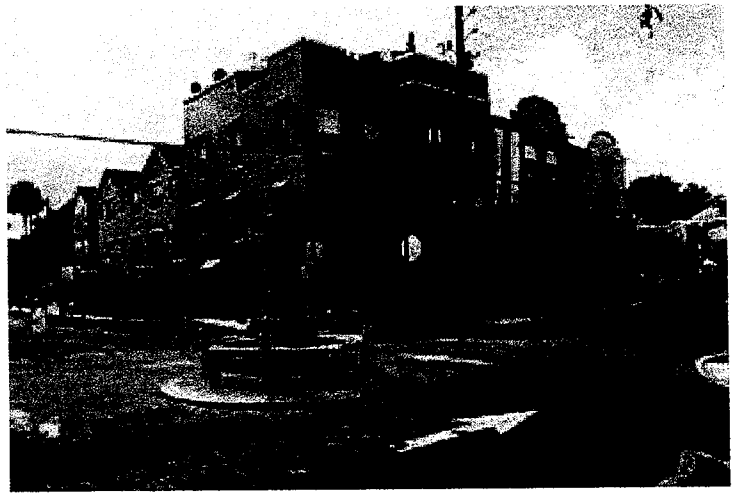


Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Low impacts	No expected noise impacts	Possible improvements

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Traffic Circle





Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Potential impacts	No expected noise impacts	Possible improvements

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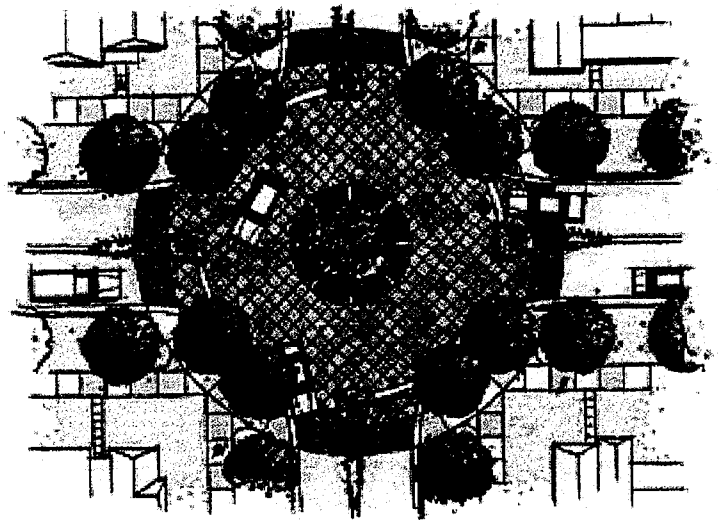
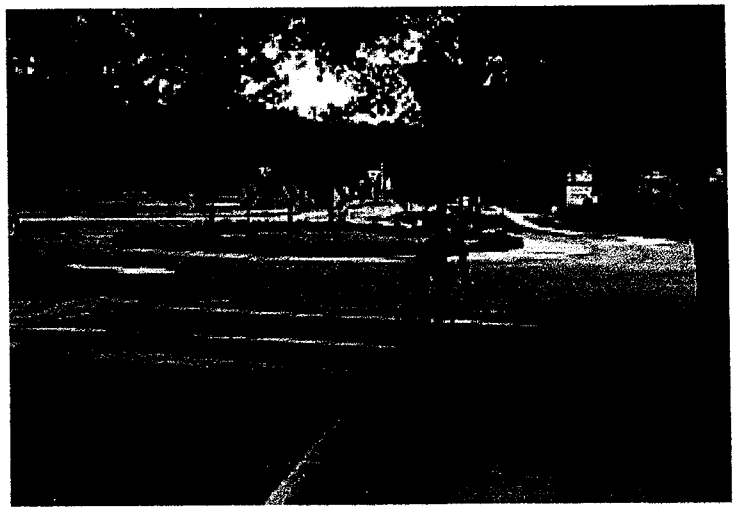
FLORIDA'S NATURAL CHOICE

Roundabout

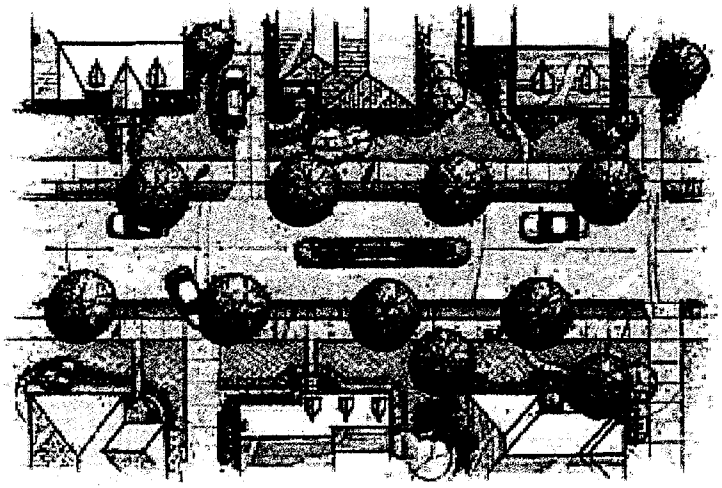




Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Some impacts	Low expected noise impacts	Substantial improvements

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

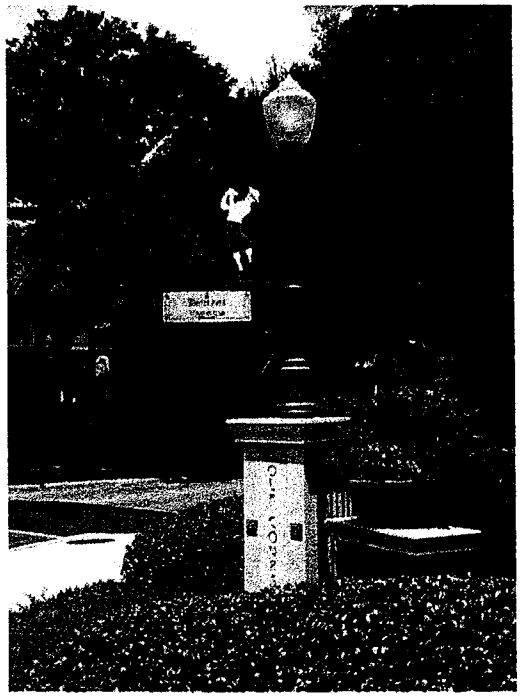
Median/Center Island



Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
May reduce speeds	Reduces traffic volumes	Some impacts	No expected noise impacts	Improves pedestrian safety

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Gateway/Entry Feature



Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Minimal reductions	Minimal reductions	Low impacts	No expected noise impacts	Possible improvements

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

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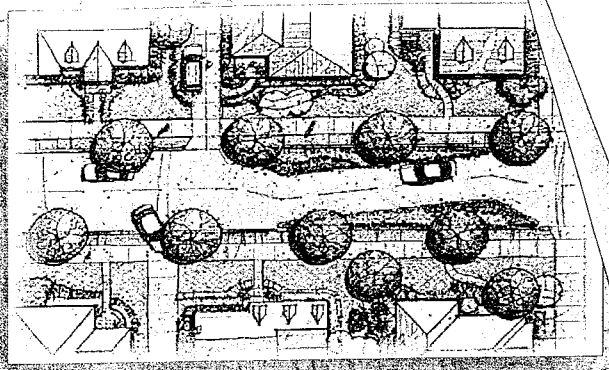
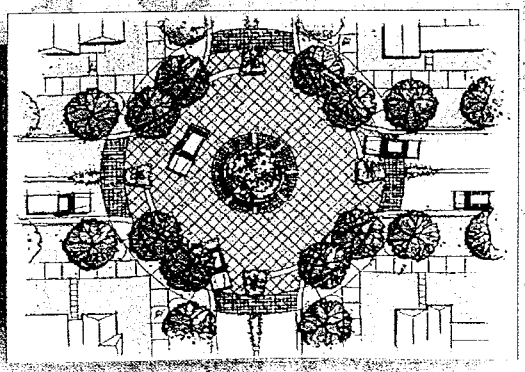
SEMINOLE COUNTY



SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

Traffic Calming Program

July 2005



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Prepared by:

PBS&J

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Orlando, Florida 32810

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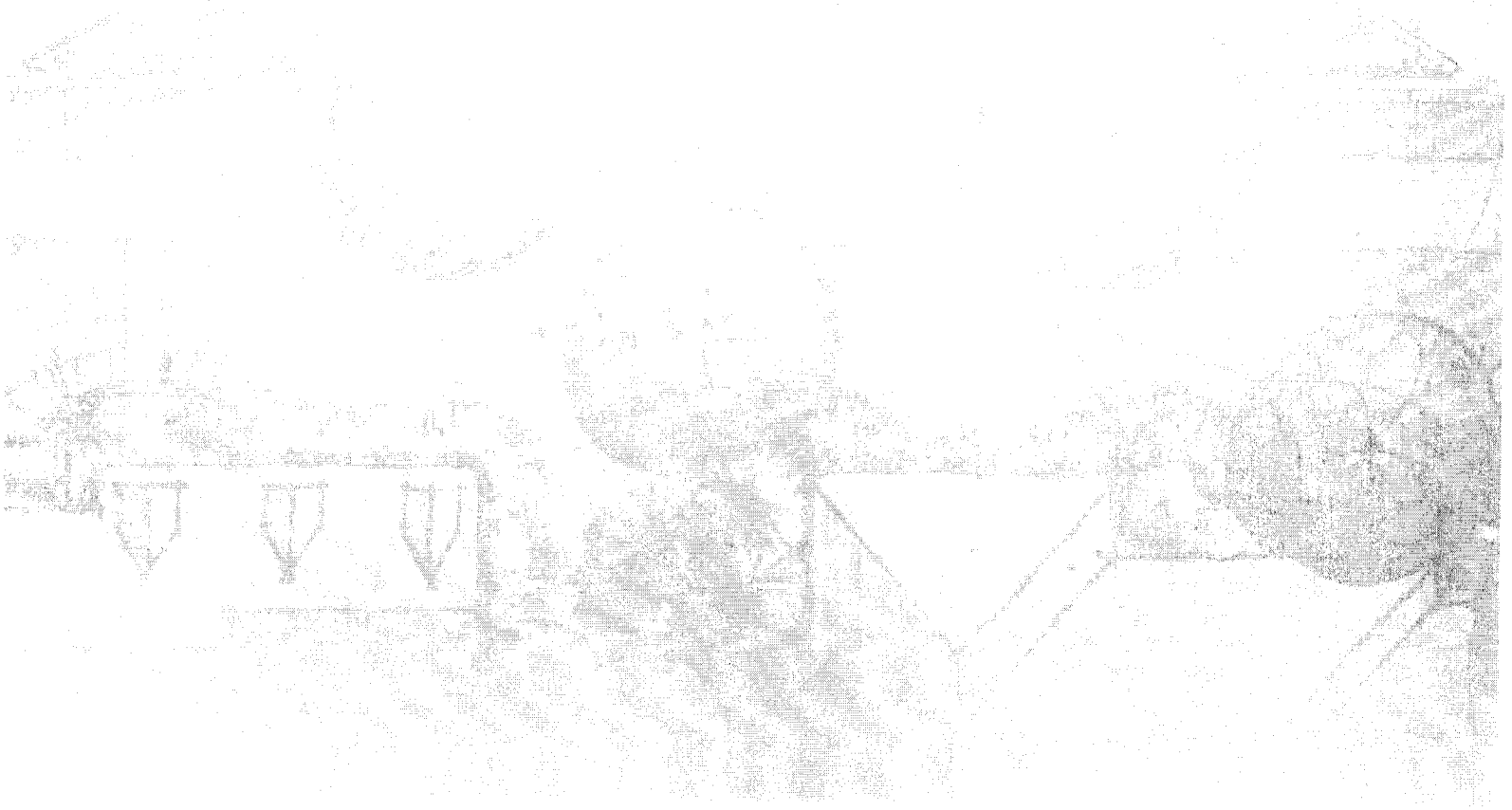


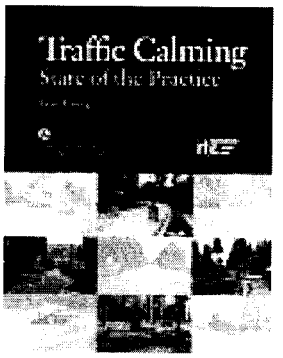
1.0 INTRODUCTION

As a result of increasing citizen interest in traffic calming, Seminole County has developed this traffic calming program and handbook. The purpose of this handbook is to provide information that assists residents and County staff in navigating the project submittal, review and approval process for the installation of traffic calming devices. This handbook contains information on Seminole County's Traffic Calming Program, including a description and history of traffic calming, the County's traffic calming Goals, Objectives and Policies, the project approval process, the project eligibility and ranking process and finally a description of those devices that have been reviewed and approved for use on County roads.

WHAT IS TRAFFIC CALMING?

As defined by the Institute of Transportation Engineers (ITE), traffic calming is:

> ***"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users."***



ITE's State of the Practice Manual

As noted in ITE's "State of the Practice", traffic calming is part of a national change in the way transportation systems are viewed today, by both the traveling public and transportation professionals. While the traditional goals of transportation planning and engineering focus on vehicular traffic and how to maximize roadway capacity, traffic calming includes all modes of travel and adds "livability" as key dimensions. Traffic calming seeks to address public concerns about speeding and cut-through traffic, and focuses primarily on local, neighborhood streets.

While definitions of traffic calming may vary, they all have in common several goals, namely:

- Reduction of vehicle speeds and/or traffic volumes
- Improving safety
- Enhancing the quality of life

When defining traffic calming, other agency's definitions go beyond the physical devices themselves and may include the three "E's,":

- Education
- Enforcement
- Engineering

Although definitions of the three "E's" vary almost as the definition of traffic calming, most programs agree on the following points:

Education
The goal of the educational component of a traffic calming program is to remind drivers of the real and potentially negative or hazardous effects of driving behaviors. This is most often accomplished by emphasizing the risk to the community's children. The educational element of a traffic calming program often utilizes neighborhood newsletters, brochures, or temporary static or dynamic signs.

Enforcement
This module involves an increased police presence and a greater allocation of manpower and materials to targeted enforcement of speed limits within a particular neighborhood or corridor. The benefits of enforcement generally only last as long as there is an actual police presence. However, this can be improved through the continued, visible and random presence of police officers.

Engineering
Generally speaking, engineering includes any modification to the physical environment, including but not limited to traffic calming installations. Engineering may also include the installation of additional regulatory signage and pavement markings

Generally speaking, traffic calming devices change the driver's environment and force drivers to modify their behavior through a combination of physical and psychological measures.

Traffic calming typically includes three different types of treatments:

1. **Vertical Measures**: Forces the vehicle to change its path vertically and uses the forces of acceleration to discourage speeding. (up and down)
2. **Horizontal Measures**: Forces the vehicle to change its path horizontally and uses the forces of lateral acceleration to discourage speeding. (side to side)
3. **Narrowings**: Is based on the psychological perception of being enclosed to discourage or reduce speeding. ("closes in" on drivers)

HISTORY OF TRAFFIC CALMING

Traffic calming is generally viewed as a European import, with its genesis in the Netherlands in the 1960s. The objectives of the original programs were to better integrate vehicular traffic with pedestrian and bicycle traffic in a shared street environment. This movement was spurred in large part by angry residents who were tired of cut-through traffic and who turned their streets into "woonerven" or "living yards". These woonerven were officially recognized by the Dutch government in 1976 and rapidly spread throughout Europe, Japan, and even Israel. By 1990 there were over 4,000 "shared streets" throughout the world.

Traffic calming did not arrive in the United States until the late 1970s. The U.S. efforts started largely on the west coast with Berkeley, California being the first U.S. city to adopt a city-wide traffic management program in 1976. Seattle, Washington was the first city to initiate area-wide studies and installations. Part of Seattle's success was based on their ability to secure funding for their program through the use of a $12-million bond issue for street improvements.

Other early adopters of traffic calming include:

Table 1.1
Other Early U.S. Traffic Calming Initiatives

Community	Year
Austin, TX	1986
Bellevue, WA	1985
Charlotte, NC	1978
Eugene, OR	1974
Gainesville, FL	1984
Montgomery County	1978
Portland, OR	1984
San Jose, CA	1978

Source: ITE, Traffic Calming State of the Practice, page 16

Some valuable experience was gained from these early adopters, often through a trial and error process. Key insights garnered from these efforts could assist in developing a new program include:

- Performing "before and after" studies to evaluate the efficiency of the devices
- Working with emergency services up-front in order to address their concerns
- Assessing public support for the devices *prior* to installing them
- Including traffic crashes among the measures of effectiveness being studied

Since these early pioneers first adopted their programs, hundreds of other cities and counties have followed with their own programs. Traffic calming has become so "mainstream" that several state departments of transportation have even adopted their own programs including Pennsylvania, Delaware, Virginia, Georgia and Vermont.

2.0 PROGRAM GOALS, OBJECTIVES AND POLICIES

PROGRAM GOALS

As previously discussed, traffic calming represents a new way of looking at the utilization of public rights of way. This new approach also relates to the goals that are established and utilized when evaluating the operation of public facilities. Whereas a greater importance was previously placed on the safe and efficient movement of *vehicular* traffic, a new emphasis has been directed toward serving all modes, specifically pedestrian and bicycle travel. This is particularly true on local and collector streets serving primarily residential neighborhoods.

The goal of Seminole County's Traffic Calming Program is to improve neighborhood livability and safety, as well as the overall quality of residential life by reducing or mitigating the negative aspects of vehicular traffic such as speeding, cut-through traffic and accident experience. This is to be accomplished through an integrated combination of Education, Enforcement and Engineering, generally referred to as the three "E's".

PROGRAM OBJECTIVES

Seminole County's Traffic Calming Program is a part of the County's commitment to make the County the "Natural Choice" for Florida residents desiring a high quality of life. This program supports several of the County's other programs such as "Safe Kids" and the Natural Lands program that seek to maintain or improve the quality of life for County residents.

The Safe Kids program seeks to prevent childhood injuries

The overall objectives of the County's Program are as follows:

- Maintain or improve resident quality of life and neighborhood livability by reducing the impact of vehicular traffic on residential neighborhoods through reductions in traffic volumes or speed.
- Maintain or improve the safety and attractiveness of neighborhood streets for pedestrians, bicyclists *and* motorists.
- Encourage citizen involvement in the application of the traffic calming program, from the initial request through the implementation of any device(s).
- Address the need for balance between the public safety interests of traffic calming and emergency responsiveness,
- Minimize the potential that any proposed traffic calming installation will not and move the problem from one neighborhood to another.
- Effectively utilize County funds and resources by validating and prioritizing citizen traffic calming requests.

Program Goals, Objectives, and Policies

2 section

These objectives are supported by and further defined in the policies of the County's traffic calming program as described below.

PROGRAM POLICIES

The following policies are established as part of the Seminole County Traffic Calming program, and are in keeping with the goals and objectives outlined above.

- For a street to be eligible for the Traffic Calming Program it must be a publicly owned and maintained street located within the County limits.
- Traffic Calming will be restricted to streets posted at 35 MPH or less.
- Traffic determined to be "through traffic" will be encouraged to use higher functionally classified facilities such as major collectors and minor and principal arterials as designated in the "Vision 2020 Comprehensive Plan".
- Any citizen initiated request for the installation of a traffic calming device must be submitted to Seminole County Public Works staff for review using the eligibility and ranking criteria outlined in Section 3.0. This will require that the "Traffic Calming Request Form" on page 8 be filled out.
- Principal or minor arterials and major collectors are NOT eligible for traffic calming. Local streets are eligible for the program and collectors will be evaluated on a case by case basis. Roadway classification will be determined using the latest adopted comprehensive plan, or as amended by the federal system update.
- As there is a potential for traffic to be re-routed to nearby streets as a result of a traffic calming device installation, the maximum amount of traffic that will be acceptable will be the lesser of 250 vehicles per day, or a greater than 50% increase in the adjacent street traffic volume. If this volume is exceeded additional studies will be undertaken to mitigate the re-distributed traffic.
- Reasonable emergency vehicle access will be maintained and appropriate agencies will be asked to review proposed traffic calming plans.
- The County will use a combination of education, enforcement and traffic calming devices to achieve the objectives outlined above, as appropriate.
- Traffic calming devices will be selected from the approved list of measures detailed in Section 4.0, and based on the needs of the particular street under study, and engineering judgment.

- The need for elimination of existing on-street parking will be evaluated on a case-by-case basis.

- If a potential project is found to be eligible for further study and ranking, County staff will evaluate the project based on the criteria listed in Section 3.0 and will then score the project accordingly. Projects will then be ranked based on this score.

- Once a project has been found to be eligible, a ballot will be mailed to the effected property owners for approval.

- No traffic calming devices will be installed unless the previous policies have been satisfied, and the proposed devices are approved by the required percentage of affected residents as outlined in *Approval Process* in Section 3.0.

- If a potential project satisfies the eligibility requirements and has been ranked on the priority list but is currently unfunded, a neighborhood association may fund the design and construction of traffic calming devices as long as they have been reviewed and approved by County staff, and are in accordance with the policies outlined in this program. Any projects installed using neighborhood funds will be maintained by the county as long as the design conforms to county standards. If the neighborhood wants a higher level of landscaping or other amenities than typically provided by the county, the neighborhood will be responsible for maintenance. This arrangement will need to be documented in a Municipal Self Benefit Unit (MSBU).

  If the minimum eligibility requirement is not satisfied, no traffic calming devices may be installed, even at neighborhood (property owner) expense.

Implementation Process

3 section

3.0 IMPLEMENTATION PROCESS

PROJECT SUBMITTAL PROCESS

Overview

As most requests are initiated by residents who will have to live with the ultimate outcome, the County wants to ensure that there is neighborhood participation throughout the process. Experience throughout the United States has shown that the most successful traffic calming programs depend on strong and continuing interaction between the community and county staff. The goal of this process is to provide a clear path for residents to follow for addressing their traffic related concerns. The County's process has two significant steps, detailed below, consisting of an eligibility screening step and a ranking and community approval step.

Step One – Identification of the Problem and Preliminary Assessment

The request for a traffic calming study is most often initiated by property owners concerns over speeding or cut-through traffic volumes. However, in addition to this common avenue there are several other means by which a traffic calming study may be requested. These include:

- Residents or home owners associations (HOAs) may ask for the installation of a traffic calming study by submitting a Traffic Calming Request Form (Figure 3-1) to the Seminole County Public Works Department. This form can be filled out in two ways:
  - On the County's website at: (http:\\www.seminolecountyfl.gov/trafficcalming/requestform)
  - It may be downloaded as an Adobe Acrobat file, printed and filled out, and mailed to the County Traffic Engineering Department the following address:

    Seminole County Traffic Engineering
    Traffic Calming Request
    140 Bush Loop
    Sanford, FL 32773
- County services such as the Sheriff's department, or a Seminole County school may also request that a study be performed.
- Seminole County Traffic Engineering staff may also initiate a study based on field evaluation, data collection efforts or as a result of other County roadway projects.

As shown on the sample form, Figure 3-1, the request should detail the location of the perceived problem, the nature of the traffic issue (i.e., excessive speeding, cut-through traffic, etc.), the time of day of the traffic related issue and any other pertinent information that may be used to evaluate the specific problem. There is no application fee for the submission to the program.

Traffic Calming Request Form

Seminole County Traffic Engineering Department

Date: _____

(Please print or type)

Name of Applicant: _____ Telephone Number: _____

Property Address: _____ ❑ Own ❑ Rent

Neighborhood Association Name: _____

Mailing Address:
(if different from property address) _____

_____

In general, please describe your traffic related concern (please check all that apply):

❒ Speeding ❒ Pedestrian/Bicycle Safety ❒ Frequent Crashes/Collisions

❒ Cut Through Traffic Volumes ❒ Other/Additional Information (please explain)

❒ Time of day for concern: _____

_____

_____

_____

_____

_____

Location – Intersection/Street(s):

_____

_____

_____

_____

Return form to:
Seminole County Public Works
140 Bush Loop
Sanford, FL 32773
Fax: (407) 665-5623

_____
Applicant's Signature

(To be completed by Seminole County Traffic Engineering Department)

Commission District: _____ Project Assigned to: _____

Traffic Engineering Department Recommendation/Action: _____

_____

_____

Figure 3-1 Traffic Calming Request Form

Once a request has been received by the Traffic Engineering Department, staff will evaluate whether or not the request could be handled through some of the preliminary measures described in the introduction (such as the installation of a "No Trucks" sign if there is problem with large vehicles frequently using a residential street). Staff will also determine whether this issue has been raised before, and if so, if any efforts had been made to mitigate the issue. The County may attempt to address any requests at this stage without resorting to a traffic calming study if it appears that the problem can be easily addressed and the proposed solution meets acceptable engineering practice.

Once the initial request has been made, County staff will determine if current traffic volume and speed data available from recent studies. If current data is not available, staff will collect adequate speed and volume data to determine the eligibility of the project under the provisions detailed in the Eligibility and Ranking Criteria.

Data Collection and Evaluation

If it is determined that data is not available for the area in question, staff will collect traffic data sufficient to perform the initial eligibility testing. This will consist of, at a minimum, 24-hours of speed and volume data that will be collected using pneumatic tubes. This data will form the basis of the eligibility testing and, if the project is found to be eligible, will also be used in the ranking process.

If the speed and volume data satisfy the eligibility requirements, Traffic Engineering Staff will schedule a community meeting to discuss the results of the data collection and to discuss the requirements for the study to proceed to the next step.

Eligibility and Ranking Criteria

Project eligibility and ranking is a two-step system and is based on the point system detailed below. The first stage of the evaluation determines a project's eligibility and the second part of the system ranks the projects relative to other potential projects.

As previously noted, gated communities are <u>not</u> eligible for traffic calming. It is suggested that these communities look into other county programs such as:

- Kids Zone www.seminolesafekids.org/safekids/whatis_national.asp
- Enforcement
- Internal Signage
- Newsletters

In order for a project to be considered eligible for a traffic calming project, it must receive a **minimum score of 45 points** from the eligibility criteria listed below.

There are a total of six criteria upon which all applications will be evaluated, including:

- Traffic volumes
- Traffic speeds
- Pedestrian facilities
- Schools
- Crash history

Traffic Volumes: This criterion is measured in vehicles per day (VPD), and is generally measured via a 24-hour automatic counter during a Tuesday, Wednesday or Thursday.

Example of new MUTCD Traffic calming signage

Traffic Speeds: This criterion is measured by the amount the 85th percentile speed exceeds the posted speed limit. The 85th percentile speed is determined through a traffic speed study and determines the speed at which 85% of all drivers are traveling at, or below. See glossary for additional information on the 85th percentile speed.

Pedestrian Facilities: This criterion focuses on pedestrian facilities and on significant pedestrian generators located within the effected neighborhood. These include bicycle routes, parks, civic institutions such as churches, U.S Post Offices, recreation facilities, etc. County Staff will determine the eligibility of such facilities and generators.

Schools: This criterion is based on the presence of elementary, middle or high schools, school crossings or a designated school bus route.

Crash History: Points will be given in this category for significant crash history as determined through a search of accident records as follows:

- 0 to 5 accidents within the last three years – 0 Points
- More than 5 crashes – 5 points (*Maximum 5 Points*)

Project Eligibility

Traffic volumes and traffic speeds will be used to determine if a project is eligible for further evaluation and ranking.

TABLE 3.1
Step One - Traffic Volume Eligibility Criteria

Average Daily Traffic (vpd)	Points
Less than 500 vpd	0
501 - 750 vpd	10
751 - 1,000 vpd	20
1,001 - 1,500 vpd	25
1,501 - 2,500 vpd	30
2,501 vpd - 5,000 vpd	40 (Maximum)

Local streets experiencing daily traffic volumes in excess of 5,000 vpd, are not generally eligible for traffic calming but will be evaluated on a case by case basis. Only streets with a posted speed limit of 35 MPH or less, will be eligible for review.

TABLE 3.2
Step One - Travel Speed Eligibility Criteria

Amount that 85th Percentile Speed is over Posted Speed Limit	Points
0 - 3 mph	0
4- 6 mph	15
7- 10 mph	30
11 - 15 mph	45
Greater than 15 mph	60

TABLE 3.3
Summary of Step One Eligibility Criteria

Criteria	Points
Volume	40
Speed	60
Total Possible Points	100

As previously noted, projects must score at **least 45 points** to be considered for further evaluation and ranking.

Once the initial community meeting has been held and the required number and percentage of effected residents has approved moving forward with the traffic calming process, Traffic Engineering Staff will move onto step two of the Implementation Process – Ranking.

Step Two - Project Ranking and Community Involvement

Projects exceeding the minimum evaluation score of 45 points will then be ranked based on the number of total points as determined in Tables 3.4 and 3.5. For the purposes of budgeting and installations, projects will be ranked based on their scores relative to one another. Projects will move into implementation based on County budgetary constraints.

Projects will be ranked once per year (although they may be submitted at any time) on June 1st for implementation purposes. Projects will then be implemented as ranked as funding becomes available.

TABLE 3.4
Step Two - Traffic Volume Ranking Criteria

Average Daily Traffic (vpd)	Points
Less than 500 vpd	0
501 - 750 vpd	10
751 - 1,000 vpd	15
1,001 - 1,500 vpd	20
1,501 - 2,500 vpd	25
2,501 vpd - 5,000 vpd	30 *(Maximum)*

Local streets experiencing daily traffic volumes in excess of 5,000 vpd, are not generally eligible for traffic calming but will be evaluated on a case by case basis.

TABLE 3.5
Step Two - Travel Speed Ranking Criteria

Amount that 85th Percentile Speed is over Posted Speed Limit	Points
0 - 3 mph	0
4- 6 mph	10
7- 10 mph	20
11 - 15 mph	30
Greater than 15 mph	45

Pedestrian Facilities
A maximum of 10 points may be awarded in this category at the discretion of County traffic engineering staff. *(Maximum 10 Points).* Specific criteria that will be evaluated when scoring this category include the presence of designated crosswalks, known high pedestrian volumes, location relative to residential developments and attractors such as grocery stores, and a well developed sidewalk network.

Schools
A maximum of 10 points may be awarded in this category at the discretion of County traffic engineering staff. *(Maximum 10 Points).* Criteria that will be considered when evaluating this category include designated walk to school routes, significant existing school age pedestrian volumes, the existing presence of crossing guards during morning and afternoon periods, and proximity to schools.

Crash History
Points will be given in this category for significant crash history as determined through a search of accident records as follows:

- 5 accidents or less in three years – 0 Points
- More than 5 accidents in three years – 5 points

The maximum number of points that a project could score would be 100. The Ranking scoring is summarized in Table 3.6 as follows:

TABLE 3.6
Summary of Step Two Ranking Criteria

Average Daily Traffic (vpd)	Points
Less than 500 vpd	0
500 - 1,000 vpd	10
1,000 - 1,500 vpd	15
1,500 - 2,000 vpd	20
2,000 - 2,500 vpd	25
2,501 vpd - 5,000 vpd	30 *(Maximum)*
Amount that 85th Percentile Speed is over Posted Speed Limit	
0 - 3 mph	0
4- 6 mph	10
7- 10 mph	20
11 - 15 mph	30
Greater than 15 mph	45 *(Maximum)*
Pedestrian Facilities	10 *(Maximum)*
Schools	10 *(Maximum)*
Crash History	5 *(Maximum)*
Total Ranking Criteria Points	**100 *Maximum***

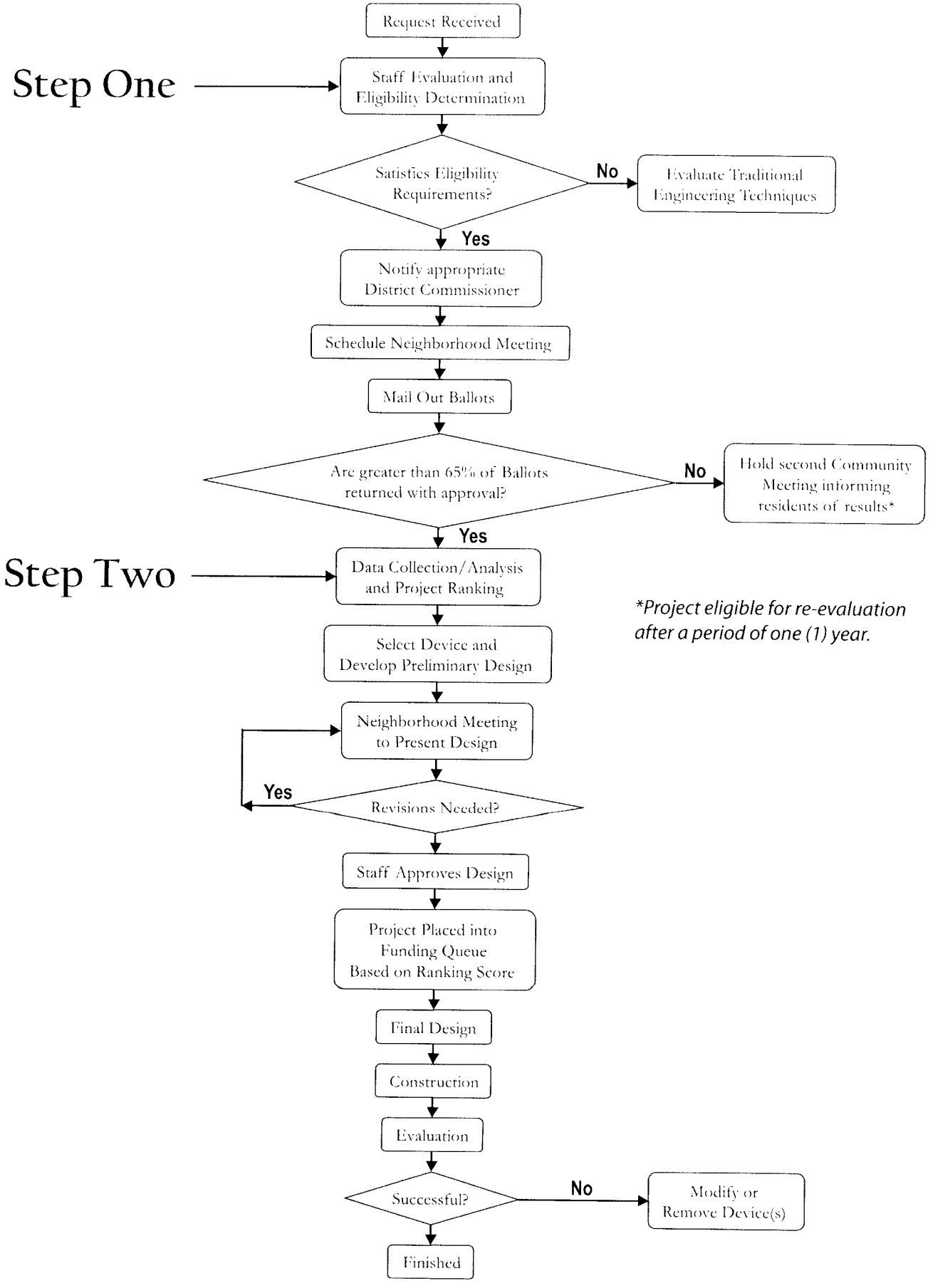
Once the project has been ranked, Traffic Engineering staff will evaluate the traffic data collected, the study area, and devise a traffic calming program to address the specific needs of the neighborhood. This could consist of "standard" traffic signing or traffic control, as well as the installation of one or more traffic calming devices. Figure 3-2 shows a flowchart of the process.

Initial Community Meeting/Kick-off Meeting

Assuming that the proposed project has satisfied the eligibility criteria, Traffic Engineering Staff will schedule a community meeting to discuss the initial traffic calming request and the results of the preliminary evaluation of the speed and volume data. This meeting will be held at a location as close as reasonably possible to the neighborhood in question, generally in the early evening hours between 6-9 p.m. This meeting will be very informal and is intended to give residents an overview of the perceived problem, elicit their comments and concerns and to discuss the community approval process described below.

Figure 3-2

Traffic Calming Program Flowchart



**Project eligible for re-evaluation after a period of one (1) year.*

Community Approval Process

In order to ensure that a representative cross-section of the effected property owners have input in the approval process, Seminole County has elected to use a mailed ballot process to determine if there is neighborhood consensus to go forward with a traffic calming project.

This process will entail a ballot being sent out to the effected property owners (Figure 3-3) that details the perceived problem, study area, a brief synopsis of the eligibility results and a list of approved traffic calming devices with a link to the County's traffic calming website for additional information. The ballot will ask property owners to vote for or against further study and possible implementation of one or more traffic calming devices and explains the required level of community approval before a project can proceed further into ranking design and ultimately construction.

In order for a potential project to move forward, the following criteria must be satisfied:

- 65% of the mailed ballots must be returned with a valid vote approving the study and the installation of traffic calming device(s),
- Property owners returning ballots, and
- Any ballots not returned will be considered a "No" vote.

A ballot will be sent to each property owner within the study area, as defined by Traffic Engineering staff. The name and address of the effected property owners will be developed using Seminole County's Property Appraiser website (http://www.scpafl.org).

Study Area

The study area will be determined by traffic engineering staff and will attempt to minimize the potential for the problem to shift from one street or neighborhood to another. The study area will be based on the existing roadway network in the vicinity of the initial traffic calming request.

Generally speaking, the affected area will extend 300 feet from the proposed device along the centerline of the street, or streets affected by the device, or to the nearest stop sign or traffic signal. All properties on both sides of the selected street(s) and within the 300 feet will be included in the affected area. This area may be expanded or contracted based on staff judgment and resident input.

Funding Constraints and Options

At present, Seminole County has a fairly modest budget dedicated for the study and installation of traffic calming devices. As such, the ranking of projects is critical to ensure a fair use of public funds for the installation of these devices. Based on the ranking of projects, and the recommended device or devices that are to be installed for a given project, Traffic Engineering staff may evaluate the potential of either breaking up a given project into multiple phases, or,

BALLOT FOR A TRAFFIC CALMING STUDY FOR THE WHISPERING PINES NEIGHGBORHOOD

Study Overview:
Recent complaints from property owners of the Whispering Pines Neighborhood regarding excessive speeding and cut-through traffic on Oak Avenue between 3rd Street and 6th Street have prompted the County to evaluate the need for the installation of one or more traffic calming devices. Before an evaluation of the stated concerns can be performed, a ballot must be sent and approved by 65% of the effected property owners as delineated by the study area.

Study Area/Effected Property Owners:
For the purposes of this ballot, the study area will be defined as that segment of Oak Avenue running north-south between 3rd Street and 6th Street. The effected properties will include all properties that access (front) onto Oak Avenue between 3rd Street and 6th Street.

Study Process
If the study is approved by the required percentage, Seminole County Traffic Engineering Staff will perform the study according to generally accepted engineering practices and the Seminole County Traffic Calming Program. The results of the study will be presented to the neighborhood at a community meeting that will be scheduled at a future date. At that time County Staff will make recommendations to the neighborhood regarding the installation of any proposed traffic calming devices.

Ballot Requirements
The undersigned owners of real property within the unincorporated area of Seminole County hereby request that the Seminole County Board of County Commissioners to perform a traffic calming study and evaluate the installation of traffic calming device(s) as described above within the above defined study area within the Whispering Pines Neighborhood.

The undersigned acknowledge(s) that by checking "For" in the box below, I/we are committing to this project and may not subsequently withdraw here from.

In accordance with the above, the undersigned hereby submit this ballot and attest that we are the true and current owner/s of the parcel/s as identified above.

If two or more names appear on the property deed, ALL must sign for the parcel to be counted as "For" the traffic calming study.

You may return your ballot to:

Seminole County Traffic Engineering
140 Bush Loop
Sanford, FL 32773

Figure 3-3 *SAMPLE* Traffic Calming Ballot

All ballots must be returned within 30 days from the date of this ballot. Any ballots not returned within the 30 days will be counted as an "against" vote. Please check one box only.

"FOR"	☐	**By checking this box, I am supporting the completion of a traffic calming study to address the issue(s) described above.**
"AGAINST"	☐	**By checking this box, I am opposed to the completion of a traffic calming study to address the issue(s) described above.**

«NAME» Signed_____

Signed_____

«ADDRESS» _____

In order for ballot process to be successful, at least **65% of the ballots** mailed by the County must be returned "For" the traffic calming study.

For additional information on Seminole County's Traffic Calming Program please go to our website at:

www.seminolecountyfl.gov/trafficcalming.com

Or contact Seminole County Traffic Engineering at:

140 Bush Loop
Sanford, FL 32773
Phone: (407) 665-5677

Figure 3-3 *SAMPLE* Traffic Calming Ballot

potentially doing two or more smaller projects in lieu of one large project. Any project that has been ranked but was not constructed due to funding constraints will remain on the ranking list for a period of three (3) years. After this period has expired, the project will need to be re-evaluated.

If a community submits a project for consideration under this program and the project is found to be in-eligible, the community must wait one (1) year before the project can be re-submitted for re-evaluation.

Depending on the availability of funds, residents who desire to see their eligible projects move forward have the option of paying for the projects themselves. This is generally accomplished through a special assessment. This would require Traffic Engineering staff to first determine the study area and then 100% of those property owners who would be assessed would have to approve the measure(s).

The specific funding mechanism would be through a Municipal Services Benefit Unit (MSBU). The Municipal Services Benefit Unit (MSBU) is a specific benefit unit established by the Board of County Commissioners via an adopted ordinance. Properties subject to the MSBU tax must derive a specific benefit from which a levy or special assessment is imposed to defray part or all of the cost of providing the benefit. This method is often used for paving dirt roads, street lighting, drainage projects, traffic calming, and landscaping in unincorporated Seminole County.

Policy Highlights

- 100% of the parcels must be located in unincorporated Seminole County for an MSBU managed by the County to be created, and the proposed traffic calming device(s) must be on a public facility to be eligible.
- A District Liaison must be designated by each district to ensure maximum neighborhood input and continuing coordination between the community and County. The District Liaison will be a representative of the effected home owners association (HOA) or neighborhood and will be actively involved in the petition process. For the same reasons, a central County staff contact is designated.
- An application and appropriate preliminary engineering survey report are required to obtain valid preliminary cost estimates.
- A petition process is used to establish MSBUs to ensure community awareness and involvement in the decision-making process. The petition process also increases recognition of the public nature of the improvements and the property owner's responsibility for payment of the assessments.
    - The District Liaison is authorized to coordinate petition completion and submission for proposed districts. All other requests requiring petition approval (including district dissolutions) are coordinated through the MSBU Office.

- In order to provide more complete information, cost estimates will be made available at the time of the petition signatures.
- The minimum percentage required for petition approval of Construction and Maintenance MSBUs is at least 65% of the property owners representing 65% of the properties within the district boundaries. Property owners not responding to the petition either "For" or "Against" will be counted in the final tally as an "Against" vote.
- The minimum percentage required for petition approval for Traffic Calming Improvements District is at least 65% of the property owners representing 65% of the properties within the district boundaries. Property owners not responding to the petition either "For" or "Against" will be counted in the final tally as an "Against" vote.
- The Board of County Commissioners may waive the 65% property owner requirement, which remains consistent with Chapter 125.01 (q) 1 of the Florida Statutes.

- An additional petition process and public hearing, beyond the minimum required to establish the district, is conducted for Construction MSBUs if the total project cost is 20% or more over the preliminary cost estimates, after the final engineering plans are completed or at the time of receiving the construction bids.
- Construction work is performed by independent contractors selected by the County.
- A financing option is provided to expedite implementation of the improvement programs.
- Separate accounts are maintained for each district.
- The district liaisons of Traffic Calming MSBUs are authorized to request minor changes that may be needed over time.
  - Minor changes for Traffic Calming Districts are defined as those which do not increase assessments to the next assessment level.

    If the cost of the requested change increases assessments in excess of the above limitations, the affected property owners must approve implementation by petition with 65% approval for Traffic Calming.
  - Minor changes for Maintenance MSBUs represent an estimated increase in annual assessments of no more than 20% over the previous year's assessment.

    In cases of Maintenance MSBUs with fluctuating costs (annual decreases or increases), minor changes represent an estimated increase of no more than 20% over the highest assessment incurred by the district.

If maintenance costs require an increase in assessments exceeding the above limitations, the affected property owners will be notified in writing of such changes.

Project Evaluation

At minimum of three months after the traffic calming device(s) have been installed, Traffic Engineering staff will perform an "after" study to determine the effectiveness of the device(s). It is necessary to wait this long for traffic patterns to stabilize in the effected area. This study will collect much of the same data as went into the initial study including traffic speeds and volume, but will also evaluate if any significant diversion has occurred to adjacent streets or neighborhoods. As previously noted in the discussion of the goals of the Program, the amount of traffic that was re-routed as a result of the traffic calming devices should not exceed 250 vehicles per day or an increase in existing traffic volumes greater than 50%, whichever is less. This criterion may be modified by staff based on special circumstances in the area and engineering judgment.

Removal of Traffic Calming Device(s)

The stringent approval requirements of Seminole County's Traffic Calming program have been designed to avoid the potential for the removal of device after it has been installed. However, under the circumstances where it may be deemed necessary to remove a device the following procedure will be used for neighborhood/community initiated requests for removal:

1. A County provided petition requesting removal must be submitted to Traffic Engineering staff representing a minimum of 85% of the properties in the effected area. Each property owner will be entitled to one signature per household.
2. Only devices installed under this program will be eligible for removal; i.e, existing devices installed prior to adoption of the program will not be eligible for removal.
3. Once the petition has been reviewed by County staff and determined to be valid, a written notice will be sent to the effected residents informing them of the decision to remove the device and the estimated cost per property owner.
4. New traffic calming devices will not be considered for five (5) years in the affected area.

Traffic calming devices can also be removed at the determination of the County. If the County initiates the removal process the removal will be at the County's expense. Potential reasons for the removal of traffic calming devices include but are not limited to, adverse crash experience, impacts to emergency services, unacceptable impacts to surrounding neighborhoods, conformity with ADA requirements or other valid reasons as determined by County staff.

PETITION

REQUEST TO REMOVE TRAFFIC CALMING MEASURE(S)
SEMINOLE COUNTY TRAFFIC CALMING PROGRAM

Contact Person: _____ Date:_____

Contact Person Address: _____

_____

Contact Person Phone _____

Number/E-mail: _____

The undersigned state that they are requesting that Seminole County consider removing the traffic calming measure(s) installed on (*street name and measure(s) to be removed*):

_____

_____

The undersigned further state that they have read the *Removal of Traffic Calming Device(s)* section of the Seminole County Traffic Calming Program. Please note that only one signature per household or property will be accepted.

Name (please print)	Address (please print)	Telephone Number	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

(attach additional sheets as necessary)

Figure 3-4 Petition to Remove Traffic Calming Devices

Traffic Calming Measures and Design Guidelines

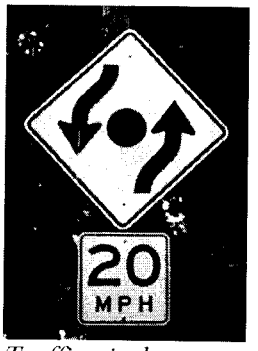
4
section

4.0 TRAFFIC CALMING MEASURES AND DESIGN GUIDELINES

This section discusses how County Traffic Engineering staff will select appropriate traffic calming devices, what devices have been approved for the program as well as an overview of the each device, its uses and its advantages and disadvantages.

This handbook does not utilize all of the traffic calming devices that are currently in use around the world. After reviewing all of the potential devices and their uses, some devices were found to be too extreme or not applicable for conditions typically found on Seminole County's residential streets.

The traffic calming measures in this program are grouped by their primary use, i.e., speed reduction, volume reduction or both. This grouping is an important step in ensuring that the correct device, or devices be selected to address the specific traffic issue at hand. As an example, a roundabout would be a good choice in reducing accident experience at a high-conflict intersection but may not be appropriate if the primary goal is the reduction of cut-through traffic volumes.



Traffic circle posted speed limit

It has been found that the most effective traffic calming applications often use two or more devices, one of which may be effective at speed reduction while the other has been shown to reduce traffic volumes. An example of this could be the combination of a center or median island that is generally effective at reducing speeds, used in conjunction with a chicane that has been shown to be effective in reducing traffic volumes.

Whatever device(s) are selected residents should remember that some of the most effective traffic calming devices can also generate significant increases in noise levels as drivers negotiate the devices.

POTENTIAL TRAFFIC CALMING DEVICE ISSUES

While the installation of traffic calming devices is often seen by residents as an immediate "fix" to a traffic problem, there are a number of non-traffic related issues that need to be considered before a traffic calming device is installed. These include the impact on emergency vehicles and services, landscaping and maintenance issues, bicycle and pedestrian considerations, impacts to property values and Americans with Disabilities (ADA) impacts. Each of these considerations are addressed below.

Potential Impacts to Emergency Vehicles and Service

Delays to emergency service vehicles is often cited as one of the most significant drawbacks to the installation of traffic calming devices. Some traffic devices can cause measurable increases in response times – especially if there are a significant number of devices along one roadway or route. The large vehicles that are used by fire departments and paramedics often have difficulty navigating traffic calming devices due to their weight, length and wheelbase. While the vertical and horizontal deflections caused by traffic calming devices only represents an inconvenience to drivers of passenger vehicles, these same deflections can cause a much greater problem for drivers of these larger vehicles.

However, since the installation of traffic calming devices has been shown to reduce accident experience and to reduce driver travel speeds, which are a major contributor in auto-pedestrian fatalities, a reasonable balance needs to be struck between two competing public welfare agendas. To that end, the County's program will assess and consider potential impacts to emergency services providers at the same time they address resident concerns over speeding and high traffic volumes. Specifically, Seminole County Public Safety staff will be involved in the review of potential traffic calming plans that affect any designated emergency response routes.

Landscape and Maintenance Issues

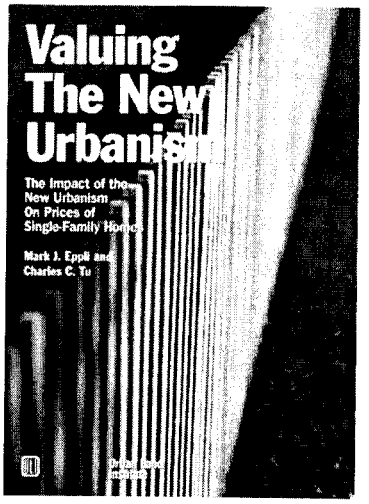
As many traffic calming devices include the use of landscaping to a greater or lesser degree, there is the very real potential for increased maintenance costs. In order to minimize these costs County staff will follow standard County guidelines as it relates to landscaping and will also seek to conform to the tenets of xeriscaping. Should a community or neighborhood desire a higher level of landscaping than the County is willing to maintain, a binding agreement can be worked out whereby the community or neighborhood agrees to bear the increased costs associated with the installation and maintenance.

An example of one of the City of Orlando's traffic circles

Bicycle/Pedestrian and ADA Issues and Considerations

Some traffic calming measures can create potential obstacles for non-motorized users including bicyclists, pedestrians and handicapped users. As an example, two of the most popular traffic calming devices, roundabouts (or traffic circles) and speed humps can cause problems for other users. Since vehicular traffic in a roundabout never actually stops, pedestrians and other users do not get the gaps that they are accustomed to in order to cross the street. This can be minimized in roundabouts with the addition of "splitter islands" which can

also act as pedestrian refuges. Speed humps can generally be traversed at reasonable speeds by bicyclists but can be problematic for bicyclists if the rider is not paying attention or is inexperienced.



Property Value Impacts

A common concern of residents regarding the installation of traffic calming devices is whether or not they have an adverse impact on property values. A study performed by the Institute of Transportation Engineers (ITE), found that the installation of speed humps was not a predictor of property values (The Economic Impact of Speed Humps on Housing Values, January 2000). Further, in Urban Land Institute's (ULA) "Valuing The New Urbanism", it was found that consumers paid significantly more (ranging from 4% to 25%) for a home in a community designed with new urbanist principles when compared to "standard" single family housing stock in the same markets. While the installation of a few traffic calming devices does not constitute a new urbanist design scheme, it does tend to be viewed as improving the overall quality of life in residential neighborhoods which in turn generally has beneficial impacts on property values.

Parking Impacts

Many of the most common and popular traffic calming devices can require the elimination of on-street parking in the vicinity of the installation. A review of Table 4-1 shows that all of the devices approved for use in the Seminole County Program can cause the loss of on-street parking. Residents desiring the installation of traffic calming devices must be aware that such installations could cause loss of parking in their neighborhood.

SELECTION OF APPROPRIATE TRAFFIC CALMING DEVICES

When evaluating the various types of traffic calming devices that have been approved, it is important to keep in mind several, site-specific considerations including, but not limited to:

Step-signs are not an appropriate traffic calming device.

- Street type (i.e, local, collector, etc.)
- The perceived problem, i.e., traffic volume and/or speed
- Emergency services route
- Pedestrian/bicyclist safety
- Grades
- Drainage
- Bus routes
- Truck routes

All of these issues must be considered as they can have a significant impact on the selection of a traffic calming device.

Stop Signs as Traffic Calming Devices

One common misnomer is the use of "stop signs" as a traffic calming device. Stop signs are <u>not</u> an appropriate traffic calming device for several reasons. Studies have shown that they only reduce speeds within 150-200 feet of the sign, and mid-block speeds (between stop signs) may actually *increase*. Further, increased noise and air pollution emissions occur at stop signs. Finally, overuse of stop signs will eventually lead to motorists ignoring them or rolling through them – both situations creating potentially dangerous situations. The main function of stop signs is to assign right of way and their installation is governed by the Manual of Uniform Traffic Control Devices, or MUTCD (see glossary).

Table 4-1 shows a comparison of the approved traffic calming devices and highlights the pros and cons of the device, estimated cost, impacts to emergency services, noise impacts and safety impacts as well as other important factors.

Table 4.1
Traffic Calming Device Comparison

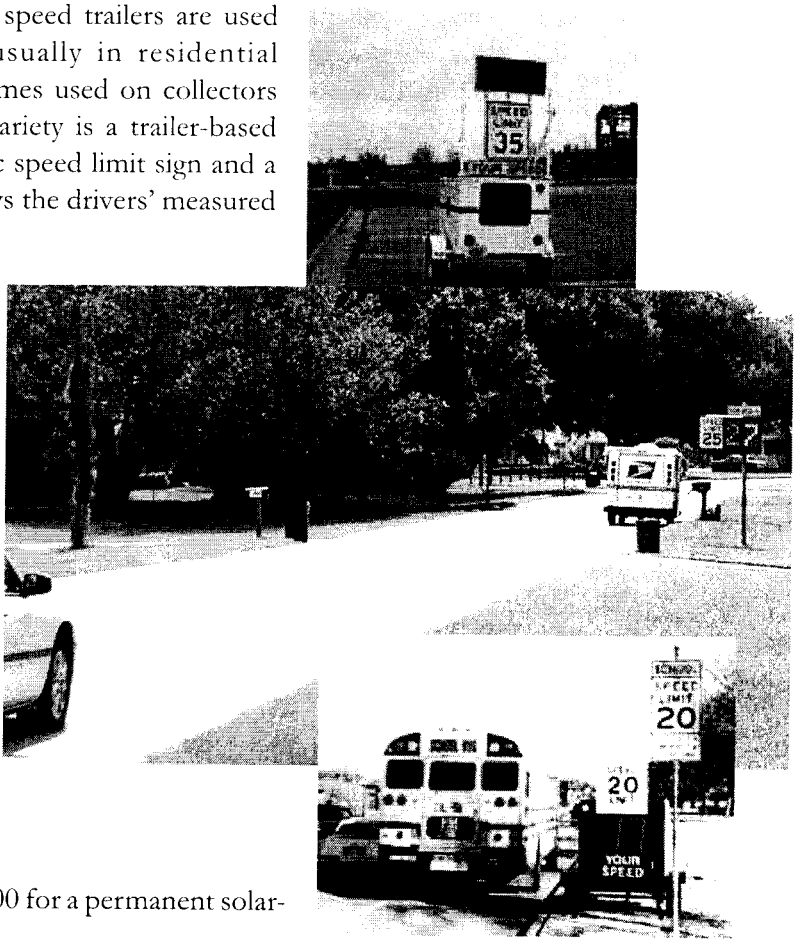
Device	Reduces Traffic Speed?	Reduces Traffic Volume	Emergency Impacts	Noise Impacts	Safety Impacts	Loss of Parking?	Est. Cost.
Speed Trailer Display	Yes	No	None	None	Maybe	No	$500/day
Mid-Block Choker	Yes	Some	Some	Maybe*	Maybe	Maybe	$8,000-$25,000
Chicane	Yes	Some	Some	Maybe*	Maybe	Yes	$15,000-$35,000
Traffic Circle	Yes	Maybe	Some	Maybe*	Imp. Auto Safety	Yes	$5,000-$20,000
Roundabout	Yes	Maybe	Some	Maybe*	Imp. Auto and Ped. Safety	Yes	$15,000-$100,000
Median Island	Maybe	Maybe	Some	Maybe*	Imp. Ped. Safety	Maybe	$5,000-$50,000
Gateway/ Entry Feature	Some	Some	None	Maybe*	Maybe	Maybe	$2,000-$50,000

**Noise impacts depend largely on the use of stamped asphalt.*

The following pages show descriptions of each of the traffic calming devices approved for use in the Seminole County program. Copies of design standards for each device are included in Appendix C.

Speed Trailer/Display

Not technically a traffic calming device, speed trailers are used primarily to reduce driver speeds, usually in residential neighborhoods although they are sometimes used on collectors and even arterials. The most common variety is a trailer-based display that combines a radar gun, a static speed limit sign and a variable message board (VMS) that displays the drivers' measured speed. It is also possible to have permanent installations that are either solar-powered or have a direct electrical connection.



Advantages

- Effective at reducing speeds
- Potential educational benefits
- Encourages speed compliance

Disadvantages

- Only effective when present and in use
- Should not be used in remote areas
- Some drivers may use it to "clock" high speeds

Estimated Cost

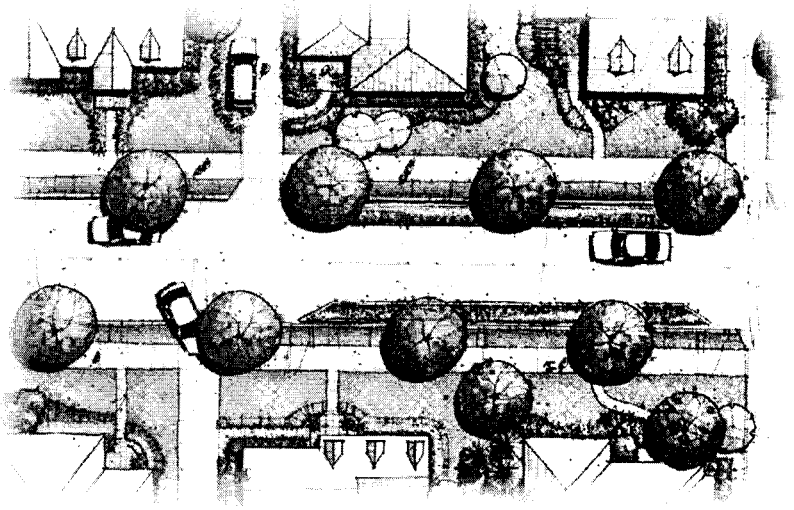
$500 per day (estimated); or, $8,000 - $10,000 for a permanent solar-powered installation.

Overall Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Reduces speed	No impacts	No impacts	No noise impacts	Minimal Pedestrian Improvements

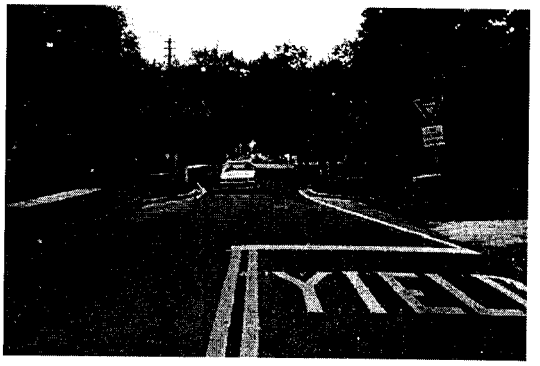
Mid-Block Choker

Mid-block chokers, also known as narrowings or pinch points, constrict the roadway forcing drivers to slow down as they enter a restricted environment. This is usually accomplished through the use of new islands with landscaping or through a widening of existing sidewalks. Chokers are most effective on wide-streets that are experiencing speeding issues. Chokers can reduce the street cross-section to two narrow lanes, often less than 24 feet in width, or further reduce it to one travel lane. One-lane chokers are currently uncommon in the United States, although Portland, Oregon uses them in their traffic calming program.



Advantages

- Effective at reducing speeds and to lesser extent traffic volumes
- Provides landscaping and gateway opportunities
- Reduces pedestrian crossing width
- Does not restrict resident access
- Negotiable by large vehicles; i.e., fire trucks



Disadvantages

- Requires elimination of on-street parking
- May cause drainage problems if not properly designed; increases maintenance issues
- May require bicyclists to merge with vehicular traffic

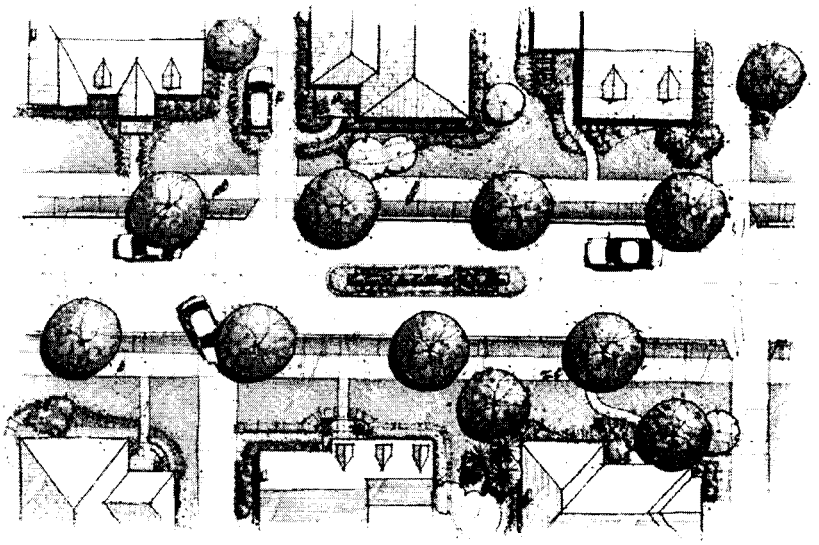
Estimated Cost:
$8,000 - $25,000; varies depending on size of installation and type and amount of landscaping.

Overall Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Reduces speed	Minor reductions	Minor impacts	Maybe, depending on pavement treament	Improves pedestrian safety

CENTER-ISLAND

Center islands are raised islands constructed along the centerline of the street so as to force drivers to deflect their travel path to the outside to accommodate the island. They function by narrowing the travel lanes and are also known as median islands. Center islands generally operate more effectively if they are not too long, at which point they can actually increase speeds. Sometimes known as "gateway islands", these devices create significant opportunities for landscaping. If the island is constructed in conjunction with a cross-walk, they can act as a pedestrian refuge.



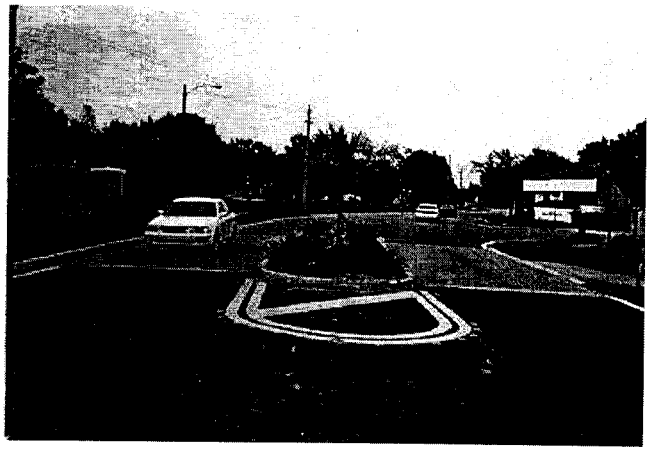
Advantages

- May reduce traffic volumes
- Provides landscaping and gateway opportunities
- Can improve pedestrian crossing safety
- Can be aesthetically pleasing

Disadvantages

- May require elimination of on-street parking
- May interrupt driveway access
- Limited speed reduction potential

Estimated Cost:
$5,000 - $40,000; varies depending on size of installation and type and amount of landscape.



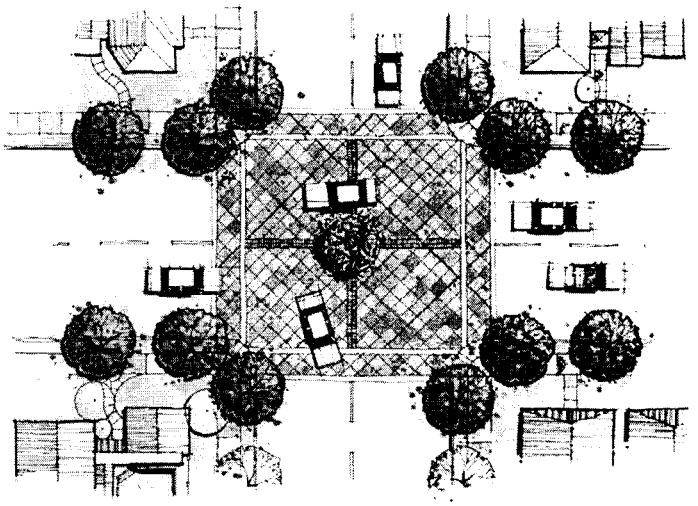
City of Orlando Center Island

Overall Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
May reduce speeds	Reduces traffic volumes	Some impacts	Maybe, depending on pavement treatment	Improves pedestrian safety

Traffic Circle

Traffic circles are generally raised islands that require drivers to make a horizontal deviation in their direction of travel, thereby forcing drivers to slow down as they maneuver around the circle.



Similar to roundabouts, traffic circles also require traffic to circulate in a counterclockwise motion. Yield signs are usually placed on all approaches to control traffic flows. They function by assigning rights-of-way among competing movements such as a through movement vs. a turning movement. They are generally used on local streets and collectors. They are not recommended for arterials.

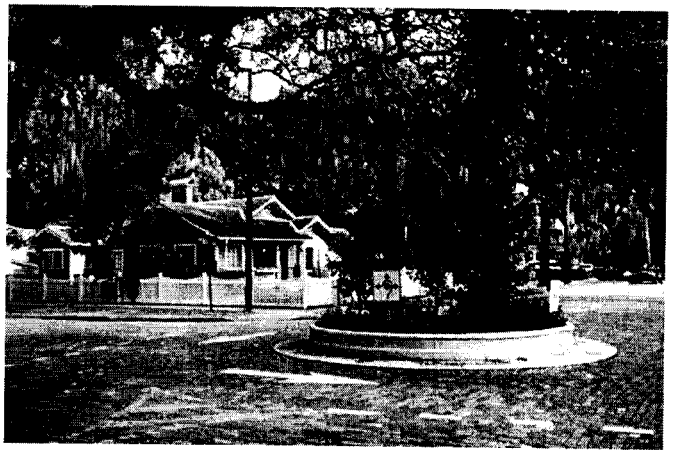
Advantages

- Effective at reducing speeds
- Does not restrict resident access
- Provides significant landscaping and gateway opportunities
- Generally low impact on emergency vehicles with the provision of a truck apron or other accommodating design
- Can calm two streets at once

Disadvantages

- Can be somewhat costly
- May restrict left-turns by large vehicles
- May effect pedestrian and bicycle movements
- Maintenance of landscaping may be an issue

Estimated Cost:
$5,000 - $20,000; varies largely depending on size of installation and type and amount of landscape and hardscape.

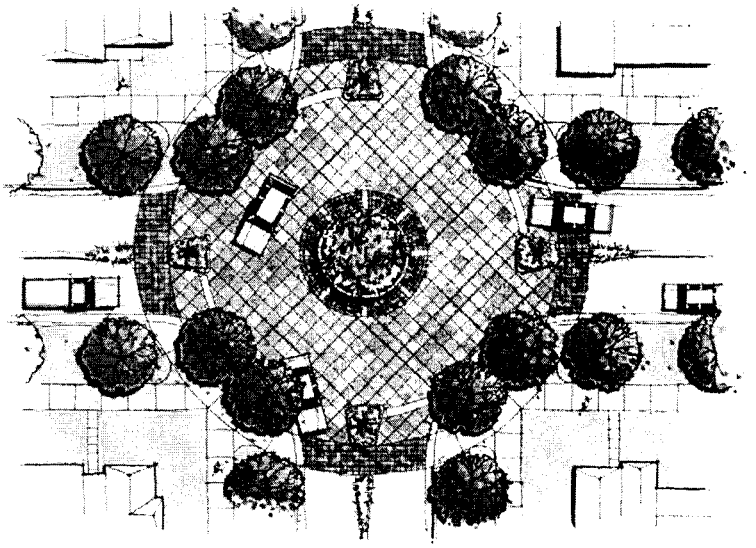


City of Orlando Traffic Circle

Overall Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Potential impacts	Maybe, depending of pavement treatment	Possible improvements

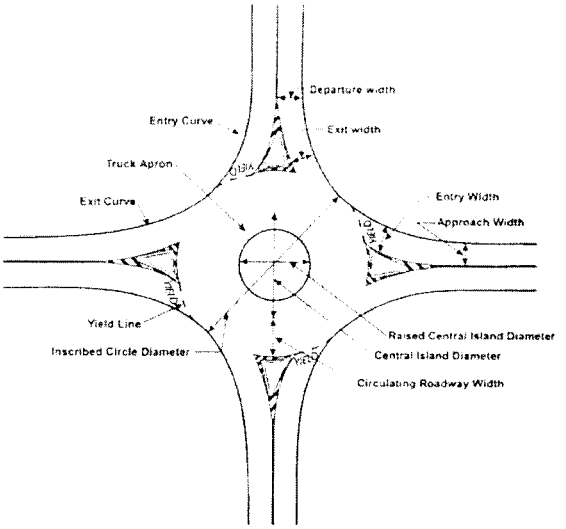
ROUNDABOUT



Roundabouts are a European import that requires traffic to circulate in a counterclockwise motion, generally around a raised center island. Roundabouts act as another type of traffic control similar to a stop sign or a traffic signal. They function by assigning rights-of-way among competing movements such as a through movement vs. a turning movement. They are generally used on collectors and sometimes on minor arterials. They are not recommended for major arterials. Roundabouts are a larger version of neighborhood traffic circles and usually have raised "splitter" islands to direct traffic into the roundabout. Generally, drivers already inside the roundabout have the right-of-way over drivers entering the roundabout from an approach street, requiring these drivers to yield the right-of-way. The provision of a truck apron, usually from bricks or other coarse materials, allows for large vehicles to traverse a roundabout while at the same time restricting passenger vehicles.

Advantages

- Effective at reducing speeds
- Less expensive to operate than signals
- Provides significant landscaping and gateway opportunities
- Generally low impact on emergency vehicles with the provision of a truck apron
- Can be installed in place of a traffic signal or 4-way stop sign.



Typical roundabout design features

Disadvantages

- Can be very costly
- May require right-of-way
- May restrict left-turns by large vehicles
- May effect pedestrian and bicycle movements
- Potential maintenance issues

Estimated Cost:

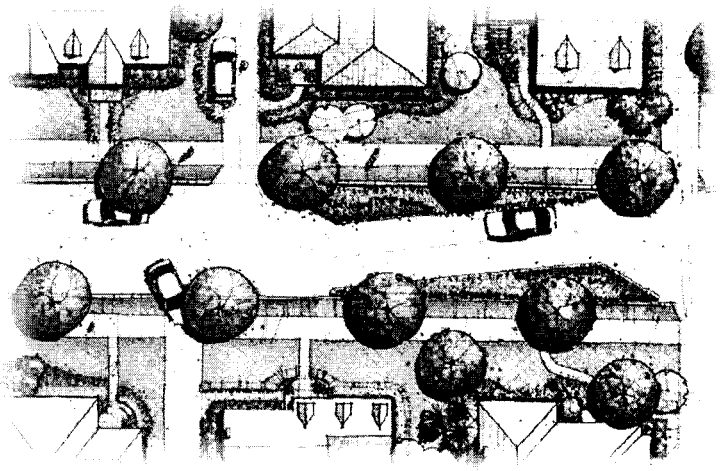
$15,000 - $100,000; varies largely depending on size of installation and type and amount of landscape and hardscape.

Overall Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Some impacts	Maybe, depending on pavement treatment	Substantial improvements

CHICANE

A chicane is a curvilinear, S-shaped street configuration or alignment that forces drivers to perform additional maneuvering and shortens visual sight lines.



This type of device can either be constructed during the initial construction of the roadway, or as a retrofit installation within existing right-of-way, generally in an island configuration. This type of device is primarily used for speed control or reduction. Chicanes are also sometimes referred to as serpentines, deviations or as a reversed curve.

Advantages

- Effective at reducing speeds
- Does not restrict resident access
- Provides landscaping opportunities
- Generally low impact on emergency vehicles

Disadvantages

- Must be carefully designed to be effective
- Can be costly
- Potential loss of parking
- May require right-of-way
- Potential drainage concerns

Estimated Cost

$15,000 - $35,000; varies largely depending on size of installation and type and amount of landscaping.

Overall Traffic Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Effectively reduces speed	Potential reductions	Low impacts	No expected noise impacts	Possible improvements

GATEWAY/ENTRY FEATURE

A gateway or entry feature generally consists of some combination of landscaping and architectural features such as columns, fences or statuary. They are primarily used to signify to drivers that they are entering a special area, usually a residential neighborhood. From a traffic calming perspective they are most effective when vertical elements such as trees or columns are combined with horizontal measures such as bulbouts or corner extensions.

Advantages

- Promotes neighborhood identity
- Can discourage cut-through traffic
- Provides landscaping opportunities/aesthetically pleasing

Disadvantages

- Minimal reductions in speed and volumes
- Can be costly
- Maintenance and irrigation requirements
- Potential drainage concerns

Estimated Cost:

$2,000 - $50,000; varies largely depending on size of installation, whether architectural features are included and type and amount of landscaping .

City of Winter Park Golf Course gateway

Overall Traffic Assessment

Speed Impacts	*Traffic Volume Impacts*	*Emergency Vehicle Impacts*	*Noise Impacts*	*Safety Impacts*
Minimal reductions	Minimal reductions	Low impacts	No expected noise impacts	Possible improvements

APPENDIX A

REFERENCES

REFERENCES

TRAFFIC CALMING PROGRAMS

- Overland Park Traffic Calming Program, Overland Park, KS
- City of Sarasota Traffic Calming Manual, Sept. 2003. Sarasota, Florida
- Neighborhood Traffic Management Program, City of Sacramento, CA
- Neighborhood Traffic Management Program, Stockton CA
- City of La Mesa Traffic Management Program, La Mesa CA
- City of Bloomington Traffic Calming, Feb. 2004. Bloomington, MN
- City of Santa Fe Traffic Calming Program, Oct. 2000. Santa Fe, NM
- City of Concord Neighborhood Traffic Calming Program, Aug. 2000. Concord, CA
- Arlington County Neighborhood Traffic Calming Program, Mar. 2000. Arlington County, VA
- City of Palo Alto Neighborhood Traffic Calming Program, Palo Alto, CA
- D.C. Traffic Calming Policies and Guidelines, 2002. Washington D.C.

WEBSITES

ITE Traffic Calming:
http://www.ite.org/traffic/tcresources.htm

Federal Highway Administration (FHWA):
http://www.fhwa.dot.gov/environment/tcalm/index.htm

City of Portland, OR Traffic Calming:
http://www.trans.ci.portland.or.us/TrafficCalming/default.htm

Public Technology, Incorporated:
http://pti.nw.dc.us/task_forces/transportation/docs/trafcalm/TRAFCALM.HTM

City of Orlando, FL:
http://cityoforlando.net/public_works/traffic/TCdrawings.htm

Traffic Calming.Org
http://www.trafficcalming.org/

City of Austin, TX, Traditional Neighborhood District
http://www.ci.austin.tx.us/tnd/

City of San Francisco Traffic, CA calming:
http://www.ci.sf.ca.us/site/dpt_index.asp?id=13576

Pennsylvania's neighborhood traffic Calming Resource:
http://www.students.bucknell.edu/projects/trafficcalming/index.html

APPENDIX B

GLOSSARY

GLOSSARY

85th Percentile Speed:
The speed that 85% of the traffic are traveling at or below. Or, the speed that 15% of the traffic is traveling faster than.

Arterial Street:
Roadways that conduct vehicular traffic between collector streets and highways. Traffic is supposed to move on a sequence through the "hierarchy" of streets: local (residential) to collector to arterial to highway, and then back down the hierarchy. See *local street* and *collector street.*

Average Daily Traffic (ADT):
The total volume of traffic, combining both directions, using a street in a single 24-hour period.

Bulbout:
A bulbous extension of the curb, usually at an intersection, that narrows the vehicular pathway and inhibits fast auto turns.

Center (Median) Island:
An island in the center of a street or intersection to protect pedestrians and provide landscaping. Medians prevent passing, and left turns, separate opposing travel lanes and provide visual enhancement.

Channelization:
The separation and direction of vehicle and pedestrian movements at an intersection into defined paths through the use of roadway features and signs.

Chicane:
Series of fixed objects usually extensions of the curb that change a straight roadway into an "S" or serpentine path to slow vehicles.

Choker:
A narrowing of the street, often in mid-block, sometimes at an intersection. May be done with curb extensions, landscaping, or islands set in the street.

Collector Street:
Intermediary streets that funnel vehicular traffic between residential streets and arterials. See *arterial street* and *local street.*

Deflection:
A vertical and/or horizontal change in the course or path of a vehicle as the result of a physical feature of a roadway. For example, a speed hump deflects the wheels, suspension and chassis of a vehicle in a vertical direction. A traffic circle requires that the vehicle be steered or deflected horizontally from its straight path to maneuver past the circle.

Entry Treatments (Gateways):
Predominantly alterations in the pavement surface, such as brick, stamped concrete or different colors, signaling to the driver that he or she is entering a neighborhood or community that may have slower speeds. Architectural details such as columns/pillars and archways also sometimes used.

Local Street:
A street for which the primary function is access to adjacent properties. See *arterial street* and *collector street.*

MUTCD:
The *Manual of Uniform Traffic Control Devices* is a reference book of national guidelines used by traffic management professionals to install signs, pavement markings, traffic signals and design work zone traffic controls.

Neighborhood Traffic Management Plan (NTMP):
Comprehensive guidelines for dealing with traffic problems in an area-wide fashion. To avoid emotional appeal, they usually set forth clear criteria and step-by-step approval process for adopting a traffic-calming solution, typically including traffic studies, petitions, area-wide ballot and municipal approval.

ROW:
Right-of-Way.

Speed Trailer Display:
Unmanned units that automatically measure the speed of approaching vehicles. Speed trailers display the measured speed to the driver on a large electronic sign. Photo radars also have the ability to take a picture of the license and a citation can then mailed to the licensee.

Speed Watch:
Neighborhood program in which volunteers are outfitted with radar guns and record the license tags of cars that speed through their community. Speeders are typically sent a "reminder" letter from the municipality to slow down.

Streetscaping:
A means of enhancing the street environment for all users of the right of way, and a means of modifying motorists behavior, through the use of physical features that provide protection, coherence, security, convenience, community identify, way-finding and orientation, aesthetic quality and interest along an urban street.

Traffic Calming:
"Traffic calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes." *[ITE's (Institute of Transportation Engineers) "Traffic Calming: State of the Practice"].*

Traffic Circle:
A small island in mid-intersection, as small as 16 to 25 feet in diameter, which forces traffic to slow and negotiate the curve. Mostly used in residential areas, they can be landscaped for aesthetic or barrier purposes, and may have mountable curbs to facilitate emergency vehicles. A "rotary," the larger, wider circle that often merges motor vehicle traffic on arterial roads or highways.

VMT:
Vehicle Miles Traveled; A measure of vehicle usage.

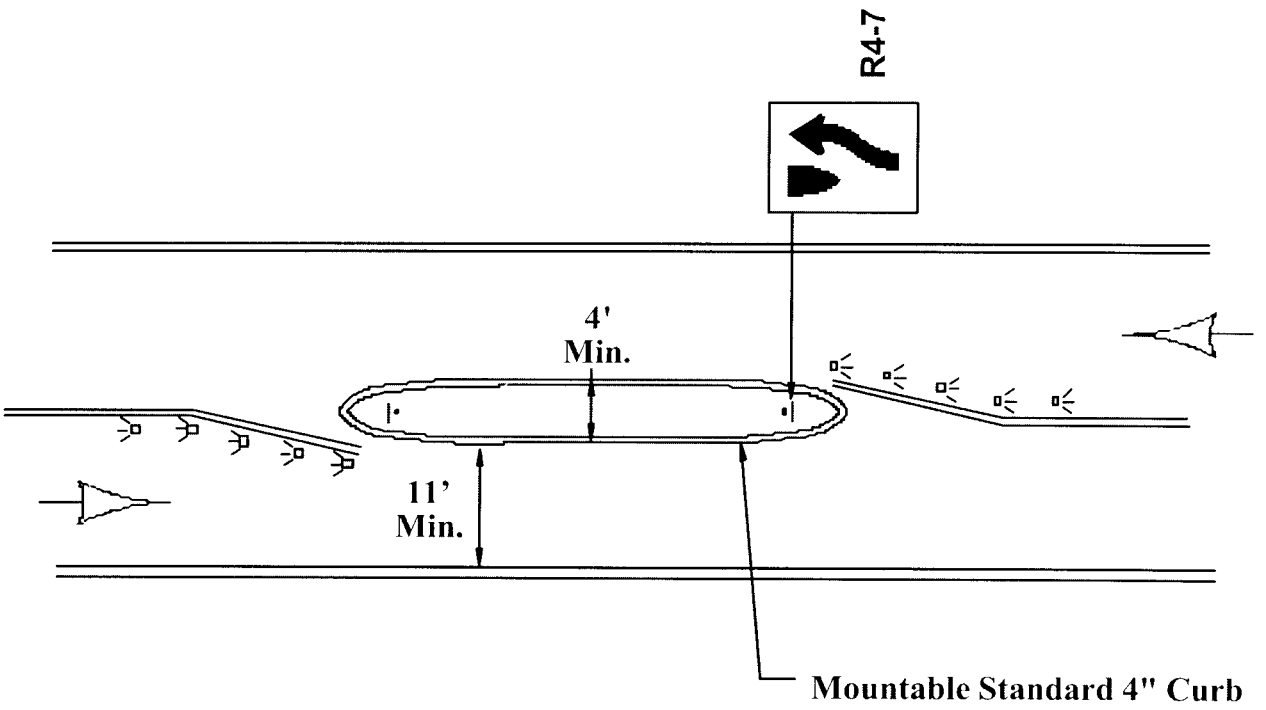
Volume (traffic volume):
Generally the number of vehicles counted passing a single point. Traffic volume is typically measured relative to a time period of 15 minutes, one hour, or 24 hours.

Warrants:
The minimum criteria necessary to "warrant" a roadway solution, such as installation of a stop sign, traffic signal or traffic calming device. Typically required are objective measures such as speed surveys, traffic volume studies and accident experience.

Woonerf:
Dutch for "living yard," and basically means space is shared by cars and people, for work, play and business.

APPENDIX C

DESIGN STANDARDS



Yellow Reflective Pavement Marker (Optional)

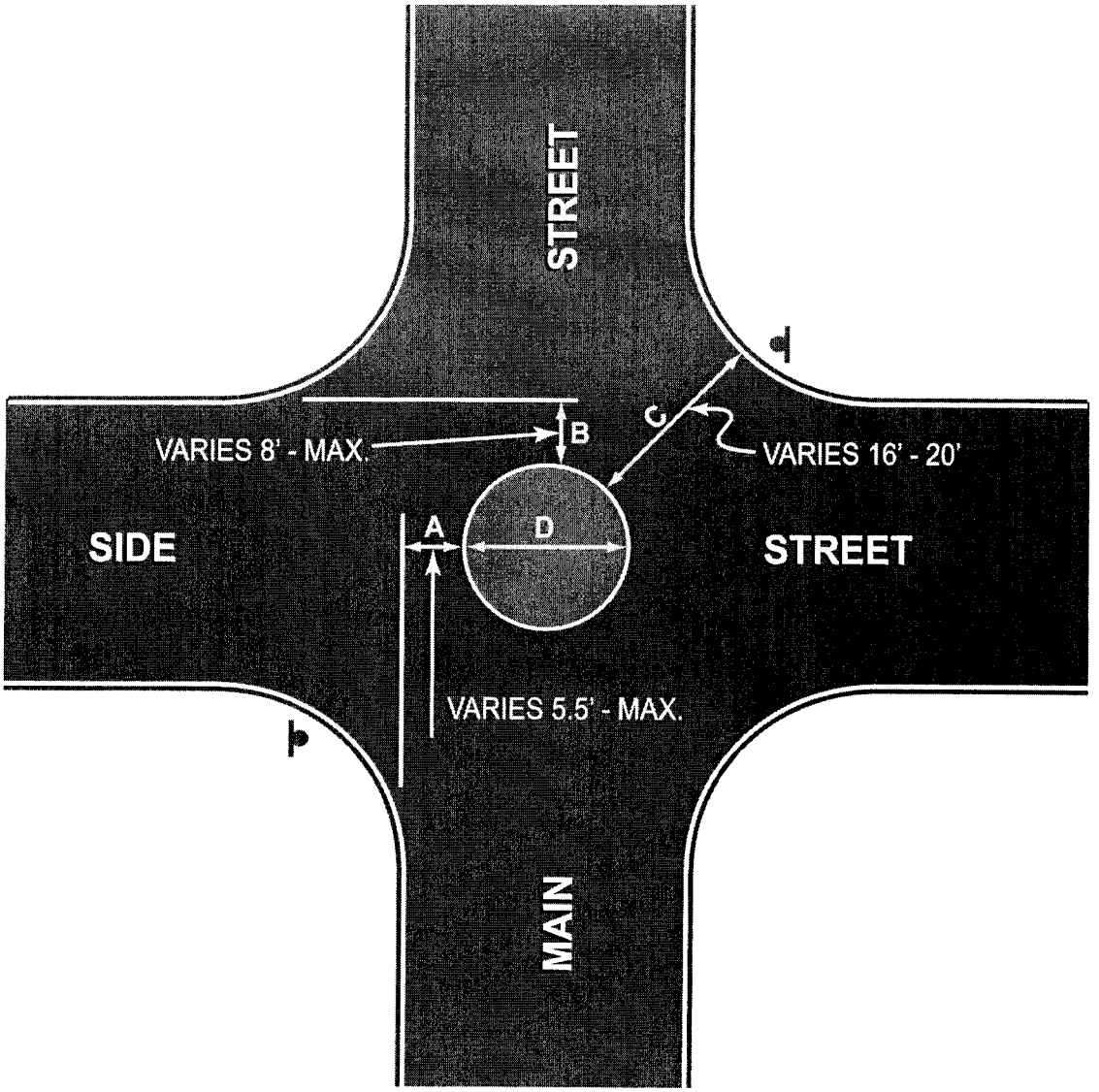
NOTES:

1) Signs and Markings shall be in accordance with the MUTCD.

2) Landscaping designs, if any, to be determined by the community and approved by the Engineer. Sight distance shall not be impacted by landscaping. Fixed objects shall not be placed in any portion of the measures that are within the clear zone.

3) The transition of the approach curb, and accompanying raised pavement markers, shall be in conformance to the design speed.

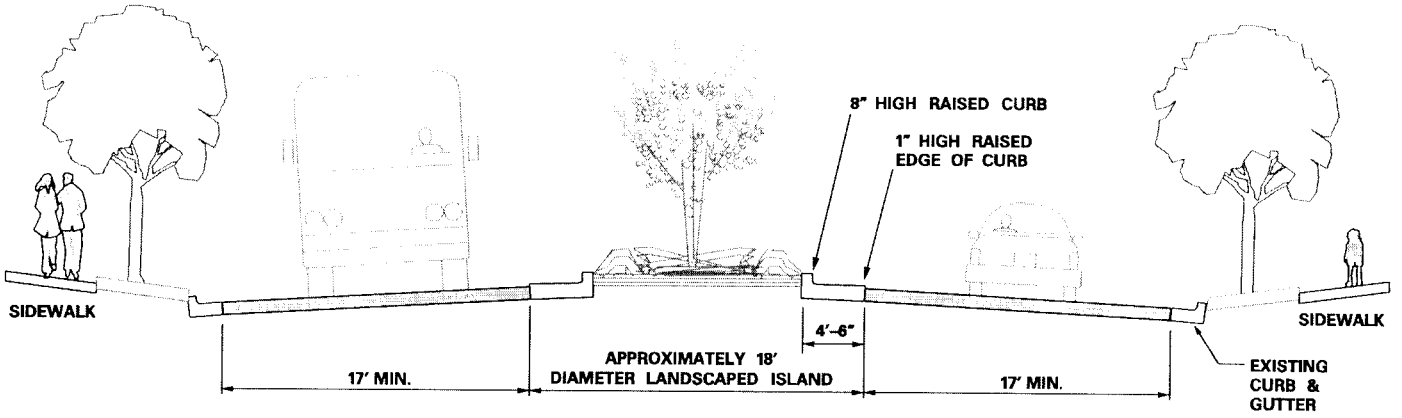
4) Engineer to modify design and location to accommodate field conditions (ex. Island length and drainage) while conforming to Seminole County's Standards and Specification manuals, AASHTO publications and acceptable engineering practices.

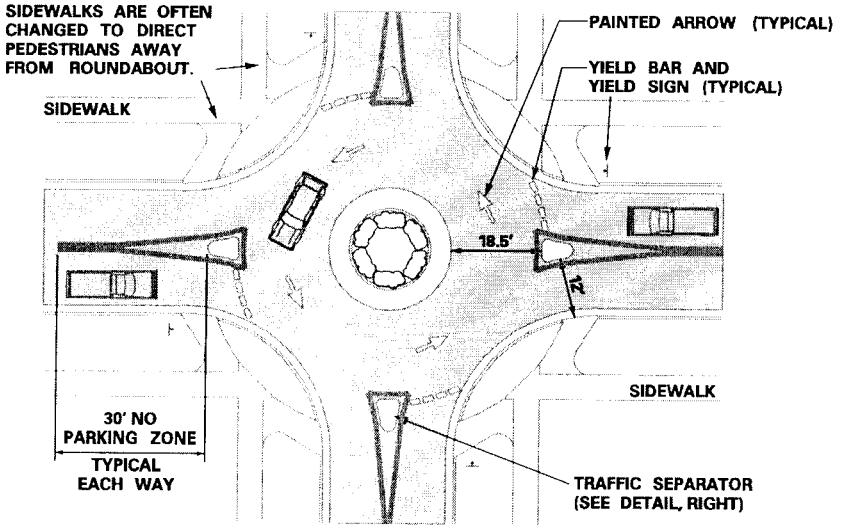


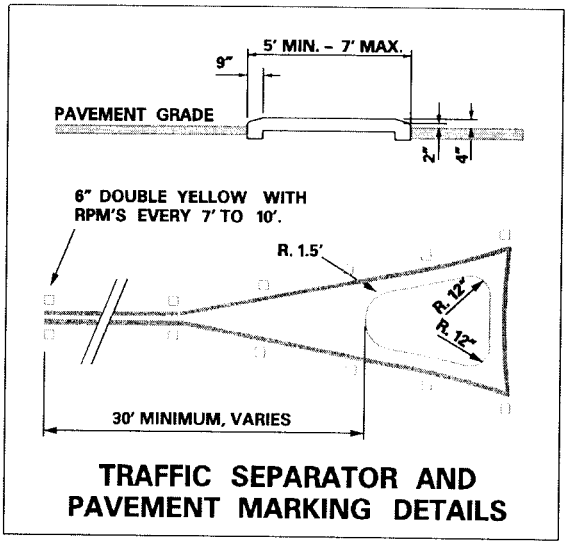
INTERSECTION DIAGRAM

LEGEND:

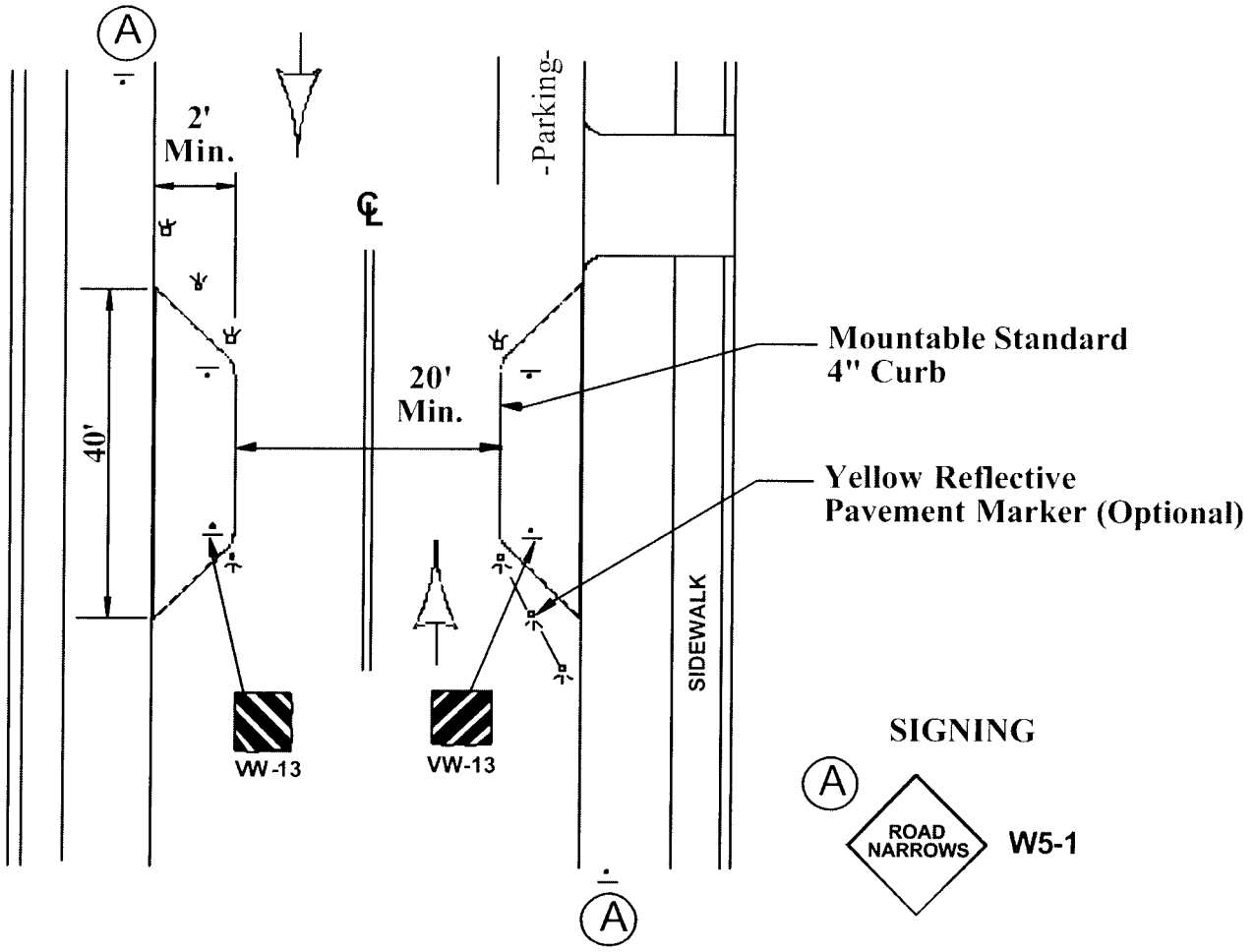
- **A** OFF-SET MAIN STREET
- **B** OFF-SET SIDE STREET
- **C** OPENING WIDTH
- **D** CIRCLE DIAMETER







TRAFFIC SEPARATOR AND PAVEMENT MARKING DETAILS



NOTES:

1) Signs and Markings shall be in accordance with the MUTCD.

2) Advance signing at each location is optional when part of an area wide scheme.

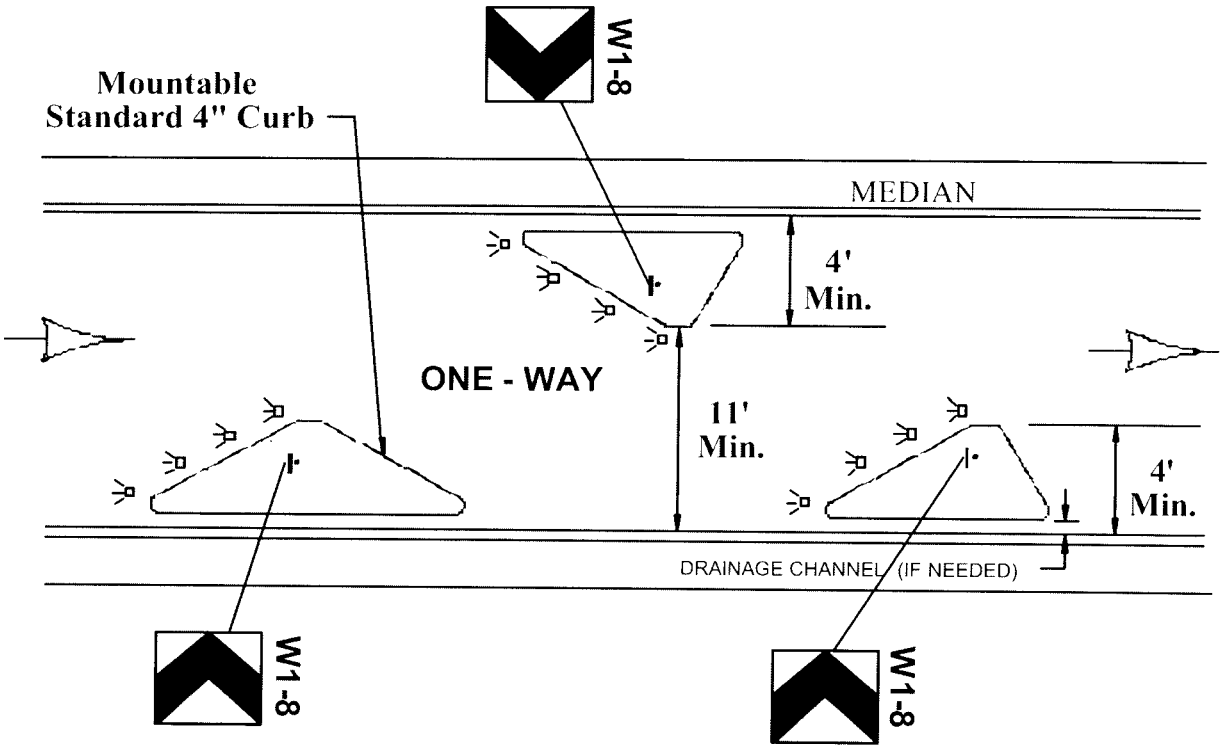
3) Landscaping designs, if any, to be determined by the community and approved by the Engineer. Sight distance shall not be impacted by landscaping. Fixed objects shall not be placed in any portion of the measures that are within the clear zone.

4) The transition of the approach curb, and accompanying raised pavement markers, shall be in conformance to the design speed.

5) Design Options:

a) Intersection or Mid-block
b) One-side or Two-side
c) Combined with Raised Crosswalk

6) Engineer to modify design and location to accommodate field conditions (ex. drainage) while conforming to Seminole County's Standards and Specification manuals, AASHTO publications and acceptable engineering practices.



ADVANCE SIGNING

W1-5L

Yellow Reflective Pavement Marker (Optional)

NOTES:

1) Signs and Markings shall be in accordance with the MUTCD.

2) Advance signing at each location is optional when part of an area wide scheme.

3) Landscaping designs, if any, to be determined by the community and approved by the Engineer. Sight distance shall not be impacted by landscaping. Fixed objects shall not be placed in any portion of the measures that are within the clear zone.

4) The transition of the approach curb, and accompanying raised pavement markers, shall be in conformance to the design speed.

5) Engineer to modify design and location to accommodate field conditions (ex.drainage) while conforming to Seminole County's Standards and Specification manuals, AASHTO publications and acceptable engineering practices.